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## ORIGINAL ARTICLES.

### REPARATIVE SURGERY OF THE PERIPHERAL NERVES.<sup>1</sup>

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THE utter helplessness of the physician in combating both central and peripheral structural diseases of the nervous system has, since its very inception, cast an opprobrium upon the healing art. Nor could it be otherwise. What therapeutic measures, aside from the knife and the saw, are capable of effecting resolution of bone or callus; limitation of a neoplasm; elimination of a blood-clot, pus or excessive cerebral fluid; of dispersing adhesions and cicatrices? Yet it is only within the past decade that these powerful agents for good have been successfully directed upon the field of nervous diseases.

Past generations of neurologists rendered their patients that were the victims of organic disease little or no permanent relief, but "they builded better than they knew," for the vast store of clinical and experimental facts which they bequeathed us, serving as a basis for the "New Surgery," has made possible the marvellous triumphs of the hour. Witness the results of MacCormac, Horsley, Keen, Briggs, and scores of others in epilepsy; of Keen and Lannelongue, in microcephalus; of Shaw and Wagner, in general paralysis of the insane—yet these are but as a handful to the whole number of brilliant successes even now to be credited to surgery.

Thus far I have drawn upon the maladies of the central system for illustrations, not because their history differs from that of the peripheral affections, for such is not the case, but because the results in the former department have been brought more prominently and persistently before the profession. Reparative nerve-surgery, conducted upon a definite scientific basis, is practically a development of the past decade. It was not until the publication by Bowlby of his Jacksonian Prize Essay for 1882, and his Astley Cooper Essay for 1886, that an attempt was made to arrive at the general surgical principles that must serve as the foundation of a rational treatment of nerve-injury.

Previous writers have been pleased to divide the

history of reparative procedures into epochs, and following them, we very naturally recognize four: The first from the time of Hippocrates and Galen to 1795, the year in which Cruikshank<sup>2</sup> established the reality of nerve-cicatization and regeneration; the second ending in 1864, with the publication by Weir Mitchell of his observations and studies, during the Civil War,<sup>3</sup> upon gunshot wounds of the nerves; the third brought to a close by the first of Bowlby's Essays, and the fourth comprising the ten years that have since elapsed.

The incidents that I have named are veritable landmarks in this field, as each in its time has served strongly to influence professional opinion. The Father of Medicine taught that divided nerves never regenerate, and such was the general belief until Cruikshank showed by experimental division of the pneumogastric in animals that such was certainly not the invariable rule, whereupon the pendulum of professional opinion swung to the opposite extreme, and we witness the general acceptance of the belief in the invariable regeneration of severed nerves. Mitchell, in 1864, and Bowlby, in 1882, did much to correct this fallacious and pernicious doctrine, but it has not, even to this day, been entirely dispelled from the professional mind. Not many months ago I heard a member of a faculty with which I was connected gravely state to his class that divided nerves required no special consideration, as, if left to themselves, regeneration invariably took place within four years. Only a refreshing and delightful ignorance of the labors of the past decade could prompt so remarkable a statement.

Bowlby's Essays, to which I have already directed attention, were, with additions, reproduced in 1889 under the title of *Injuries and Diseases of the Nerves and their Surgical Treatment*,<sup>3</sup> and at once secured a wide circulation, being read with pleasure and profit by surgeons the world over; and so exhaustively has the author treated his subject in these published writings that followers can hardly hope to add much that is really new to the wealth of experimental and clinical facts that they contain. However, the possession of a personal experience differing in certain important particulars from that of the author named, and a desire to bring to your attention the possibilities of the future as well as to

<sup>1</sup> Read before the Indiana State Medical Society, May 12, 1892.

<sup>2</sup> Transactions of the Philosophical Society, 1795.

<sup>3</sup> Injuries of Nerves. Mitchell.

<sup>3</sup> London, 1889.

record the achievements of the past, must make any necessary amends for the present paper.

The integrity of nerve-function may be (a) impaired or (b) destroyed by pressure, contusion, or division, which may arise intrinsically or extrinsically, being developed rapidly or gradually, as the result of local or general exciting causes; accordingly the symptomatology and prognosis of this class of lesions vary within wide limits. Generally speaking, a lesion resulting from a general or systemic exciting cause—as, for example, an alcoholic or arsenical neuritis—is multiple, and consists essentially in a destruction of the ultimate axis-cylinders. Such lesions are therefore not amenable to surgical treatment, and are consequently foreign to this paper.

*Symptomatology.* It is hardly necessary to state that the symptoms attending nerve-injury vary in nature and intensity with the character, severity, and duration of such injury.

*Contusion.* Contusions, if single and moderately severe, give rise to a momentary sharp pain, often followed by transient tingling and numbness over the area of distribution of the nerve. I dare say there is no one present who has not at some time suffered a contusion of the ulnar nerve as it passes through the internal notch at the elbow, constituting what is commonly known as the "funny-bone." When single nerves or groups of nerves are subjected to slight, repeated contusions there is often little or no pain, but the numbness and pricking gradually give way to muscular paralysis, and finally, in extreme cases, to complete motor and sensory paralysis, constituting the so-called "sleep or occupation palsies," crutch-paralysis, etc.

Severe contusion of a nerve may result in an immediate loss of muscular power without impairment of sensation, more rarely in paralysis or perverted sensation, the motor functions remaining intact. Occasionally simple contusion may result in complete motor and sensory paralysis, but such an occurrence is rare, and unless speedy improvement is manifested, the diagnosis must be seriously questioned.

*Compression.* As is but natural to expect, the character and severity of symptoms attending nerve-compression are dependent altogether upon the intensity, duration, and particularly upon the rapidity of action of the compressing force. The pressure exerted by the retraction of a cicatrix may never give rise to pain or marked anesthesia, making its existence evident only by muscular wasting or trophic changes in the skin; while a nerve incarcerated and compressed within a line of fracture may engender such excruciating pain as seemingly to necessitate amputation.

In general, the symptoms of compression differ

only in degree and rapidity of development from those of division, and accordingly they may with profit be considered together.

*Division.* Division or extreme compression of a nerve is followed at once by complete muscular and sensory paralysis over the area supplied by it, and hence an intimate acquaintance with the ultimate cutaneous and muscular distribution of the peripheral nerves is an absolute requisite for the correct interpretation of such phenomena. It is just here that one is often led astray. Take the anterior tibial nerve, for instance. Its cutaneous distribution is limited to a small area on the dorsum of the foot, and an injury, except it be a chance penetrating wound, which would sever this nerve, would at least partially divide the extensor muscles or tendons of the foot, and the paralysis, which of course really results from the division of the nerve, is likely to be ascribed to the wounded tendons, since the integument supplied by this nerve, and the consequent anesthesia, is so limited in extent as to be readily overlooked. This is not an imaginary instance, but actually occurred in one of my early cases.

In testing the cutaneous sensibility, after supposed nerve-division, it is very important to remember the manner in and extent to which cutaneous nerves overlap each other, as in injuries of a given nerve there is never developed a clearly-defined area within which function is entirely abolished, and outside of which it is normal. Even after division of nerves of considerable size the area of absolute anesthesia may be quite limited, but surrounding this are zones or bands exhibiting all degrees of sensation up to the normal.

It is equally important to remember that the tissues underlying the skin may be, and in point of fact usually are, supplied by *different* nerves; hence in examining a given area, friction or firm pressure may seem to elicit sensitivity of the *skin* when none really exists. It is quite generally taught that sensation, when not altogether destroyed, may be modified or perverted in various ways. An area insensitive to ordinary forms of irritation may still be capable of distinguishing heat from cold; or one in which the tactile sense is altogether abolished may be the seat of heat, prickling, numbness, etc. This is an undeniable fact, but I take exception to its usual interpretation. Personally, I doubt very much if the so-called phenomena of perverted sensation have, in reality, any connection with normal cutaneous sensitivity. The anesthetic integument is not so bad a conductor of heat but that the nerves of the underlying cellular tissue, if intact, may be influenced by the temperature of the examining body; and the tingling and numbness which are referred by the patient to the anesthetic area are, in reality, I believe, engendered in the proximal nerve-

stump by the reparative changes going on there. We have analogous instances in the knee-pain of hip-joint disease, and in painful stumps after amputation.

*Electric reactions.* The faradic excitability of the paralyzed muscles usually disappears within three or four days. Bowlby has seen only one case in which it persisted more than a week. Galvanic excitability I do not find to be augmented in man, although Erb<sup>1</sup> found it so in animals. On the contrary, and I am supported in this observation by Bowlby, there is a rapid diminution of excitability, so that it disappears altogether between the third and sixth week. It is a common observation that in man the A. C. C.  $\Rightarrow$  K. C. C., constituting the so-called "reaction of degeneration." Formerly, this symptom was accepted as positive proof that the nerve was irreparably injured. Surgery has made such an interpretation no longer valid. It is, nevertheless, of considerable value, showing, as it does, that the muscle is physiologically cut off from the cord. The electric reactions are of little prognostic value, as sensation, and very often motion, reappear before electric excitability is re-established.

*Trophic changes.* When a part is altogether deprived of its connection with the multipolar cells of the anterior gray horns there ensues a gradual but marked change in its nutrition. Its integument becomes smooth, shiny, and frequently the seat of distressing *causalgia*. The muscles waste, and the action of their unopposed antagonists results in permanent contractures, giving rise to various characteristic deformities. The hair over the paralyzed area falls out or becomes brittle and stumpy; the nails become curved in their long axis, and extremely arched from side to side; while often thin, shiny, and vitreous. They are as frequently stumpy, uneven, and fibrous, and present series of notched, transverse ridges of varying height. The affected areas, owing to their anesthetic condition, are liable to suffer from burns, frost-bite, or other forms of traumatism, and the vitality of the tissues being extremely low, there is but little tendency to repair, so that extensive sloughing and gangrene are not infrequent.

The lack of trophic influence is seen as well in the sweat-glands. An injury of a cutaneous nerve that falls short of complete division, particularly if neuritis exist, gives rise to excessive secretion of sweat over the affected area; if, however, the nerve be severed, the area remains dry and parched, even when the remainder of the body is bathed in perspiration. Although typical trophic changes occur more rapidly after complete division of a nerve, they are not infrequently seen in instances of

gradually progressing compression. Often there is witnessed localized edema, followed by muscular wasting, yet with little or no impairment of motion or sensation. Such a condition is pathognomonic of compression.

*Shock.* Mitchell is the only writer who notices shock as following simple nerve-injuries, and as his cases were largely gunshot wounds, it is highly probable that the shock observed is to be ascribed to the nature of the injury, rather than to the structure involved.

*Nerve-regeneration.* As I have before stated, it was Cruikshank, in 1795, who first established the fact of nerve-cicatrizization and regeneration. The briefest possible sketch of the succeeding theories, speculations, clinical and experimental observations having a legitimate bearing upon the subject would of itself far transcend the necessary limits of the present paper, and I must content myself with briefly outlining the views now generally held.

Within a few hours after nerve-section the axis-cylinder swells at the cut end and becomes striated as the result of imbibition of stagnant endolymph. It then breaks down into isolated fragments, which, in part, are removed by leukocytes. The only histologic elements persisting within the sheath are the large oval nuclei, each containing one or more shining nucleoli, which are attached to its inner side. This breaking-down is usually completed within two or three weeks, and coincidentally there occurs a degeneration of the motor terminal plates. Together, these changes constitute the so-called Wallerian degeneration;<sup>1</sup> but contrary to the teachings of Waller, we now know that this breaking-down does not result in permanent destruction of the distal segment. The persisting nuclei of the sheath of Schwann are true neuroblasts, which, after a varying length of time, multiply and become fibrillated, and, receiving a new investment of myelin, become the new nerve-fibers.

If, during this regeneration, the severed ends are maintained in apposition, a permanent histologic and physiologic regeneration is effected, the new nerve-fibers becoming continuous with or replacing those of the lower segment. If the ends are separated by a substance readily permeated by the nerve-granulations the result is the same; but if the intervening substance be a cicatrix, a slip of neurolemma, or other fibrous tissue, union is completely inhibited, and after a varying length of time a second and permanent degeneration is inaugurated. This is proved by the investigations of Bowlby and others, who have found the distal segments of severed nerves entirely without axis-cylinders years

<sup>1</sup> Handbook of Electro-therapeutics.

<sup>2</sup> Proceedings of Royal Society (Eng.), 1860-62.



after division. That this secondary degeneration is extremely slow and that it occurs only after a considerable interval, is shown by successful secondary suture of the ulnar nerve by Jessop<sup>1</sup> nine years after the injury; by Brenner,<sup>2</sup> of the median nerve after ten years, and by Tilloux,<sup>3</sup> of the same nerve fourteen years after it had been divided.

We have shown the importance of maintaining in apposition the ends of the divided nerve if one would secure regeneration. That this must be accomplished by artificial means must be evident, for it cannot fail to impress the most casual observer that the natural conditions do not favor such apposition. There is normally a retraction of from half an inch to an inch when the nerve is severed, and this, as I have already shown, is of itself usually sufficient to defeat permanent regeneration. When spontaneous regeneration does occur it is susceptible of but one explanation: either the nerve was not entirely severed or it is the result of an extremely fortunate accident.

Various retentive measures have from time to time been recommended, but the suture is and must be preëminent. It was first employed by Baudens in 1836, and revived by Nélaton and Langier in 1863 and 1864. Ignorance and superstition have done much to retard the general acceptance of this valuable procedure. There have been those who advised against its employment on the ground that it produced neuritis, epilepsy, lockjaw, inflammation of the skin, and other trophic changes. So recent a writer as M. Nicaise in *Ashhurst's Encyclopediu* advises against suture of severed nerves in simple wounds. These are just the cases in which it should be practised. A perfect and rapid recovery is practically assured if the primary suture is properly made; but if it is neglected, it is almost certain that suffering and deformity will follow, and that a secondary operation under far less favorable circumstances will ultimately become necessary. The moral and legal responsibility of the surgeon in these cases was well put by a commission appointed a few years ago by the Royal Belgian Society of Medicine and Natural Sciences to consider this subject. This commission reported to the Society that in its opinion "the surgeon who fails to suture a severed nerve commits almost the same fault as if he failed to reduce a fracture or bring together the ends of a severed tendon." In the light of the recent past it is possible to put the matter in stronger terms. The surgeon who neglects a severed nerve commits a greater fault than he who fails to reduce a fracture. Lack of attention to a fracture entails upon the patient deformity and limited usefulness of the

part; a neglected nerve-wound brings all these, usually in an aggravated form, and besides, only too often, persistent and agonizing pain, loss of sensation as well as of motion, and distressing trophic changes.

*Primary suture.* As is indicated by the term, a primary nerve-suture is one used to unite a nerve within the first few hours following an injury, before any degenerative changes have taken place. Its results are very satisfactory. Bruns (in 1884) was able to collect 71 cases, of which 33 per cent. were successful. The writer has from all available sources been able to add to these 34 cases, of which 30 were successful, making a total of 104 cases, 77, or 74 per cent. of which were successful. Suppuration is as prejudicial to the early union of nerves as it is to that of other tissues, and hence it is of the greatest practical importance to secure in such wounds a perfectly aseptic condition, thus assuring primary union throughout. Such wounds should not be drained. A consideration of the reported cases shows that catgut, if properly prepared, is by far the best suture-material.

*Secondary nerve-suture.* The first secondary suture, we are told by Senn,<sup>1</sup> was made by Nélaton, in 1865. The operation was done in Germany by Simon and Langenbeck, in 1876. Bruns was able to collect 33 cases of secondary suture, of which 24 yielded a favorable result. I have been able to collect 75 additional cases of secondary suture, only 4 of which could be considered as failures; or, out of a total of 108 cases, the result was satisfactory in 95, or in 88 per cent. of the cases.

*Finding the ends.* If a nerve has been divided for some time, the ends are usually found imbedded in cicatricial tissue and separated to the extent of from one to three inches. The central ends are usually enlarged, and have frequently been mistaken by surgeons for true neuromata. It is often a matter of difficulty to find the lower segment, as it wastes, loses its color and firmness, so that it may readily be mistaken for a slip of fascia, a band of muscle, or a bloodvessel. Sutton,<sup>2</sup> from his experience with neurotomy in horses, describes a band of fibrous tissue which he found invariably to connect the two ends, and which he regards as a valuable guide in locating them. Bowlby and Timothy Holmes<sup>3</sup> think that such a band is but rarely found in man, although subsequent observers have found it sufficiently often to justify one in looking for it in every case requiring secondary suture.

*Resecting the ends.* It usually becomes necessary to freshen or resect the ends of the nerve in order to secure continuous nerve-tissue, which has been

<sup>1</sup> British Medical Journal, Dec. 2, 1872, p. 642.

<sup>2</sup> Wiener klin. Wochenschr., Jahrg. iv, No. 18.

<sup>3</sup> Reported by Reclus, physician and surgeon, 1887.

<sup>1</sup> Principles of Surgery, 1891, p. 63.

<sup>2</sup> Trans. London Clin. Soc., 1887.

<sup>3</sup> Loc. cit.



shown to be the prime requisite to the regeneration. The bulbous central end must be cut off and enough of the thin, frayed-out peripheral end trimmed away to give a good surface for approximation.

*Overcoming shortening.* Various expedients are at times necessary to overcome the retraction or shortening of which I have spoken. Stretching, if not done with too great force, is often effectual in overcoming shortening of an inch or more. Létiévant<sup>1</sup> suggests that the defect be overcome by turning down flaps from the divided ends and suturing them in the middle, making a bridge of nervous tissue between the ends. No entirely successful results have thus far followed the application of this method. Glück<sup>2</sup> proposed overcoming these defects by nerve-grafting, a device that he employed successfully in animals. Tillemans,<sup>3</sup> Kaufmann,<sup>4</sup> and Robson and Ward<sup>5</sup> have since successfully carried out this suggestion in operations upon man. Robson and Ward transferred a piece of nerve from a recently-amputated leg in one instance, and in another a piece of the sciatic nerve from a rabbit. The latter was the method employed by Tillemans, while Kaufmann employed the sciatic nerve from a dog. Assaky proposed *suture à distance*, by which he means the interposition between the cut ends of an aseptic, absorbable substance like catgut, which may serve as a temporary scaffolding for the granulations from the nerve-ends, a method that has since been successful in the hands of Glück.<sup>6</sup> Létiévant<sup>7</sup> also suggests the idea of grafting the severed end upon the intact trunk of a neighboring nerve—a method that has proved partially successful. Bergmann<sup>8</sup> has resected the humerus to reach the same end, but this suggests cutting down a tree to pick its fruit. It has also been proposed to overcome the defects in the nerve by placing the extremities in either end of a decalcified bone-tube, closing the wound as in other reparative methods. If but a moderate defect exists, it can often be overcome by making the resection obliquely.

*Results.* Restoration of function must not be looked for immediately upon the operation of secondary suture. The first return of sensation may not occur until months afterward, and the operation cannot be said to be a failure unless there fails to be material improvement after the expiration of two or three years.

*Operation.* The operation of nerve-suture is easily described and simple enough—on paper. The ends,

being found, are held by an assistant, while a catgut suture, threaded into a Hagedorn needle, is passed through first one and then the other nerve-stump about three-fourths of an inch from the end. The suture is then drawn just tightly enough to hold the ends loosely in apposition, when they are "whipped" together by fine catgut. Undue tension should be prevented by forced flexion of the part, maintained by a plaster or other rigid dressing.

#### CASES.

CASE I.—J. R., a Swedish carpenter, aged forty years, was admitted to my service at Cook County Hospital during the summer of 1888, apparently in perfect health, except that the sensation and grasp of the right hand were sensibly impaired. He stated that he had first noticed a tingling or numbness in the hand six or eight months before, which gradually became more severe, and a few months later he noticed that the strength of his grasp was much diminished. The disability being a serious matter to him, as it interfered with his use of tools, he consulted a physician, who treated him for rheumatism. Becoming no better after several months' treatment, he sought admission to the hospital.

Examination: The power in the right hand is *nil*. Sensation is extremely blunted; the hand perspires freely and almost continuously; A. C. C. = K. C. C. He was ordered local injections of strychnine, gr.  $\frac{1}{16}$ , three times daily. Having a suspicion of the true nature of the lesion, I visited the ward at night and found him sleeping with his head resting upon the affected forearm. I wakened him, and instructed him to refrain from this habit, but twice again during the same night I found him in this position. Further treatment consisted in restraining measures and the continuation of the strychnine, under which there was complete recovery within a month.

This case, while properly foreign to the paper, is related as an example of the class of so-called "sleep or occupation palsies."

These are due to repeated contusion of a nerve or group of nerves, in some instances resulting from posture assumed during sleep, and in others, from pressure by implements and the like.

Another frequent example of this form of lesion is the "crutch-paralysis," caused by repeated contusions of the brachial plexus by the crutch-head. So common are paralyzes following a drunken stupor, during which the arm is allowed to hang heavily over the back of a chair, that in London hospitals these cases are familiarly known as "Saturday-night paralyzes."

CASE II.—J. R., a clerk, aged twenty, was admitted to the hospital in the fall of 1888, the victim of a foot-bath. No convenient tub being at hand, he concluded to bathe his feet by standing in a stationary wash-basin. His weight broke out the bottom of the basin, and his legs, wedging into the

<sup>1</sup> Traité des Sections Nerveuses.

<sup>2</sup> Virchow's Archiv, 1878.

<sup>3</sup> Berlin. klin. Wochenschrift, June 8, 1883.

<sup>4</sup> Rev. des Sci. méd., vol. xxiv, p. 305.

<sup>5</sup> British Medical Journal, September 13, 1891.

<sup>6</sup> Deutsche med. Wochenschrift, May 5, 1891.

<sup>7</sup> Op. cit.

<sup>8</sup> British Medical Journal, 1884, ii, p. 1085.

hole with great force, were cut through to the bone just above the ankles. The force of his fall broke the basin still further, allowing his knees to become wedged into the opening, again cutting through to the bone on both sides. The flexor tendons of both feet were cut and immediately sutured. A casual examination of the skin of the legs and feet detected no anesthesia. Union of the divided tendons occurred in about two weeks, when it was found that, on the left side, the area of the dorsum of the foot supplied by the anterior tibial nerve was anesthetic, and the muscles supplied by it were paralyzed. A dissection at the site of the lower wound exposed the nerve, seemingly intact, but perfectly flaccid. An exploratory incision was then made at the site of the higher injury, and the nerve, as it passes forward through the interosseous membrane, found to be intact. A further exploration of the lower wound now showed that the nerve had been cut at its extreme upper margin, permitting a separation of an inch and a half. These ends were freed from the mass of cicatricial tissue surrounding them, freshened, the foot firmly flexed, and the nerve sufficiently stretched to bridge the shortening, sutured with catgut, and the wound closed without drainage. Recovery was slow but uneventful.

CASE III.—A German waiter, whose name I do not now remember, fell during the early part of 1888, and, striking against a stone step, broke his left arm at about its middle, producing a compound comminuted fracture. This was wired by Dr. Price and primary union secured. Just as he was about to leave the hospital he began complaining of pains and numbness in the hand, followed shortly after by wrist-drop. The condition became progressively worse, and soon it was evident that the musculo-spiral nerve was either divided or being compressed. An exploratory incision showed the nerve to be intact, except that at the site of the old fracture it passed through a large mass of callus. This was chiseled away, a bed of muscle prepared for the nerve, and the wound closed without drainage. Recovery was complete in about nine months.

CASE IV.—Mrs. W., aged thirty-five, received a wrist-cut in an altercation with a neighbor, and when I saw her was almost exsanguinated, having sustained a wound of the ulnar artery and nerve. Within an hour suture of the nerve with catgut was practised, and the hand firmly flexed and dressed in plaster. Twenty hours from the time of the operation sensation had returned throughout the ulnar area. Motion was not restored until about the second month. The ultimate recovery was complete, and close examination is now necessary to detect the wounded wrist.

CASE V.—William P., a roller in the American Rod Mill, of this city, became entangled in a loop of one and one-eighth inch white-hot steel as it came from the rolls, and received a deep burn across the front of the left leg just below its middle, the steel burning into the cavity of the tibia, at the same time dividing the muscles, and the anterior tibial nerve and artery. There was also an extensive loss of soft parts over the front and inner surface of the leg, and the internal ligaments of the ankle-

joint were burned away, laying bare its articular surfaces. With some difficulty the ends of the divided nerve were recognized, their charred extremities freshened and by gentle traction brought together and sutured by fine catgut. The other injuries sustained at the time resulted in a considerable loss of tissue, so that the wound had to heal by granulation, but union of the nerve occurred, with the return of sensitivity and motion throughout the anterior tibial area.

CASE VI.—About a year ago, J. G., a bricklayer, aged thirty-five, fell while walking over some boilers, striking with his full weight the point of his elbow upon the head of a boiler-rivet. He suffered severe pain in the forearm during the next hour or so, but after that time returned to his work. Though suffering considerably, he worked for about two weeks, when he was obliged to give up. After two weeks' rest he began again, but for the next six months alternated between rest and work, when he was obliged to give up altogether. On examination the arm above and below the elbow was found swollen and indurated; there was considerable limitation of motion; he suffered almost continuously from sharp, darting pains running from the elbow down into the forearm. The ulnar border of the arm was swollen and edematous, and the seat of excessive perspiration. There was some wasting of the muscles, and the grasp of the affected hand was about half that of the sound one. There was a slight evening rise in temperature and occasional chills. Under chloroform a four-inch vertical incision was made over the posterior surface of the joint, and the nerve, as it passes through the internal notch, was discovered imbedded in a firm cicatrix, and it was only freed after a troublesome dissection. Exploration in the region of the olecranon elicited indistinct fluctuation, and, upon cutting down, a pus-cavity was found involving the olecranon, the ulnar nerve forming a part of its inner wall. The compact layer of the bone was destroyed for about three inches, and the pus had burrowed into the cancellous tissue. The diseased bone was freely cut away, the cavity curetted, irrigated with a 1:4000 bichloride solution, the wound sutured, and the arm dressed in plaster. There followed an uneventful recovery, so far as the nerve-symptoms were concerned, and the man is now putting in full time at his trade.

As I have already stated, the pain following the incarceration of a nerve within the line of a simple fracture has in the past led to amputation.<sup>1</sup> The incarceration of any tissue within a fracture is, as I had occasion to show in a paper published last year in the *New York Medical Journal*,<sup>2</sup> very likely to inhibit union, and such incarceration is of itself a sufficient indication for operative relief. When

<sup>1</sup> Callender, Smith, and Sir W. Lawrence have made amputations through the leg for pain following incarceration of nerves within the line of fracture. *Injuries and Diseases of Nerves*, Bowlby, p. 259.

<sup>2</sup> Some Unusual Fractures of the Leg. *N. Y. Medical Journal*, Oct. 10, 1891.

that tissue is a nerve, and there is added to the probability of non-union the excruciating, agonizing pain which observers report in this condition, there can be no question but that immediate operative relief is imperatively indicated. Under such circumstances a surgeon should not hesitate, but he should cut down upon the fracture, release the incarcerated nerve, and, to make sure of perfect apposition, wire or nail the fragments.

Bowlby does not recognize in this condition an indication for operation, but it would seem that just here may be achieved the greatest advance over our predecessors.

It may be truthfully said that the surgeon has worked wonders in the department of nerve-injuries in the past, but by careful study, close application, and the exhibition of native ingenuity, the future gives promise of still richer rewards.

NOTE—*Sept. 1st.* Since reporting Case VI a secondary operation for osteo-myelitis of the ulnar shaft has been necessary. The nerve-symptoms, however, abated altogether after the first operation.

#### AT WHAT AGE SHOULD THE FIRST TREATMENT OF CONGENITAL CLUB-FOOT BE INSTITUTED?

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THE special feature of this meeting is the discussion of the treatment of club-foot, but such discussion would be incomplete without some consideration given to the proper time for the first treatment to be instituted in order to be most efficacious. Notwithstanding the absence of any well-authenticated reason, and often in direct opposition to well-established facts, a vast number of cases still go on to maturity with uncorrected, relapsed, or only partially corrected feet. That this is due largely to misconception as to the proper time to begin treatment, as well as to apparent want of knowledge of what that treatment should consist, is clearly understood by all orthopedists.

The general practitioners, however, often advise delay, or they overlook the necessity for appropriate treatment early applied and persistently continued. As accoucheurs should often direct the first treatment and decide as to the age at which it should be applied, it is important that they know the results of experience. In the table of cases reported by Dr. E. H. Bradford,<sup>1</sup> the age at which the cases were first seen by him is given as follows:

2 cases at	4 weeks	2 cases at	2½ years
1 "	7 "	4 "	3 "
2 "	2 months	11 "	4 "
10 "	3 "	12 "	5 "
2 "	4 "	6 "	6 "
1 "	5 "	4 "	7 "
7 "	6 "	1 "	9½ "
1 "	7 "	1 "	10 "
3 "	8 "	3 "	11 "
6 "	1 year	2 "	12 "
2 "	1½ "	2 "	15 "
1 "	20 months	1 "	18 "
10 "	2 years		

The experience of others is similar to the above, and I have quoted Dr. Bradford instead of referring to my own case-book. An explanation of the delay, shown in the foregoing statement, may be found in the indefinite and often misleading statements of accepted text-books and writers on surgery, from a few of which I quote. Ashhurst<sup>1</sup> says: "Mechanical extension should be resorted to in the third to the fifth week, not before the third week. . . . The best age for tenotomy is between the second and third month." J. B. Roberts recommends<sup>2</sup> "immediate correction by force, maintaining the position by gypsum bandage, and tenotomy after two months." Agnew<sup>3</sup> advises treatment "at an early period of life, but tenotomy not earlier than fourth or fifth month." Fisher<sup>4</sup> thinks that the most favorable time for tenotomy is when the child is six weeks old. Morton<sup>5</sup> urges manipulation from early babyhood, but condemns tenotomy before the child is able to walk. A. S. Roberts<sup>6</sup> states that "mechanical appliances should always be granted a fair trial before resorting to operation." Milliken<sup>7</sup> considers that the best time to do tenotomy is when the child would begin to walk, but he advocates the institution of manipulation at birth. Prof. Sayre<sup>8</sup> says "if prompt treatment were the rule, section of the tendons would rarely be called for, but should be resorted to when necessary." Gross<sup>9</sup> "Age is no bar to tenotomy." Druitt<sup>10</sup> "The earlier tenotomy is done after other treatment fails, the better." Ewens<sup>11</sup> "No educated surgeon of the present day would, I imagine, allow an infant to reach the age of three months without tenotomizing every contracted tendon or putting on suitable apparatus; but it becomes a serious question how far one would be justified in allowing a child to grow up beyond

<sup>1</sup> Ashhurst: *Prin. and Prac. of Surg.*, ed. 1885, p. 686.

<sup>2</sup> Roberts: *Modern Surgery*, ed. 1890, p. 736.

<sup>3</sup> Agnew: *Surgery*.

<sup>4</sup> Fisher: *Internat. Encycl. Surg.*, ed. 1888, vol. iii, p. 681.

<sup>5</sup> T. G. Morton: *Tr. Am. Surg. Assoc.*, 1890, vol. viii, p. 71, 72.

<sup>6</sup> A. S. Roberts: *Clinical Lect., Phila. Hosp.*, Nos. 1 and 11, 1886.

<sup>7</sup> *Trans. Amer. Orthop. Assoc.*, 1890, vol. iii, p. 50.

<sup>8</sup> L. A. Sayre: *Trans. Ninth Internat. Congress.*

<sup>9</sup> S. D. Gross: *System of Surg.*, ed. 1882, vol. ii, p. 1036.

<sup>10</sup> Druitt: *Modern Surg.*, ed. 1887, p. 491.

<sup>11</sup> John Ewens: *Brit. Med. Journ.*, Oct. 17, 1891.

<sup>1</sup> Read before the American Orthopedic Association, September 20, 1892.

<sup>2</sup> *Trans. Amer. Orthop. Assoc.*, 1889, vol. i, p. 89.



age of three years when it is evident that the bony deformity is so great as to defy rectification by free tenotomy." Bryant<sup>1</sup> recommends manipulation and strapping a few days after birth, and tenotomy when necessary. He has operated at one week. Stephen Smith<sup>2</sup> recommends treatment as soon after birth as possible. Wyeth says:<sup>3</sup> "All forms should be treated from birth, and tenotomy determined by degrees of resistance." Moullin<sup>4</sup> urges that treatment be begun in infancy and that tenotomy be performed if manipulation, etc., fail. Schrieber<sup>5</sup> advises tenotomy as early as possible. Parker<sup>6</sup> says: "It may be laid down as a canon that treatment should be commenced immediately after birth, and that tenotomy is an essential feature of the treatment of many cases." Pye<sup>7</sup> says: "I believe that it will be found much speedier and a more satisfactory plan to recognize from the first that early tenotomy will give the best results." Bradford<sup>8</sup> says: "Treatment should be begun as early in infancy as possible; the amount of time gained by tenotomy is not great." Vance<sup>9</sup> begins treatment on about the tenth day by manipulation and retention apparatus and when that is not satisfactory divides the tendo Achillis. H. Hodgen<sup>10</sup> believes in the majority of cases in cutting the tendon and rectifying the deformity at once, not taking time to stretch the tendon. Steele<sup>11</sup> says of club-feet: "If they can be corrected without cutting, it would be far better." Keen and White<sup>12</sup> say: "The earlier the deformity is corrected and the foot held in the right position, the better; time may be saved by tenotomy."

A plan of treatment appropriate to one case or class of cases is often inadequate in others, and therefore treatment when referred to in this paper will mean the thorough correction of the deformity, its proper maintenance, and the application of measures having for their object the full establishment of the functions of the foot. In whatever degree the deformity may exist, attempt should be made at the earliest possible moment after birth to correct the deformity. The first day is none too soon, in my opinion, and the longer the delay the more difficult will be the recovery. In no case should plaster-of-Paris or fixed and immovable appa-

ratus be kept on for more than one month, for their continuance tends to produce muscular atrophy.

In all cases passive motion, gymnastic exercises, friction, and the encouragement of motion in proper directions should be early instituted and persistently maintained. In all cases the form of apparatus selected should make elastic, in preference to rigid, retention, to enable the patient voluntarily to move the foot in the proper direction, but upon the cessation of muscular effort to restore it to its normal position. In cases of the first degree, or in which the deformity is easily corrected and the correction is easily maintained, operative procedure in infancy is rarely, if ever, necessary. In cases of the second degree, or in which the deformity is corrected with difficulty, and in which considerable restraining force is required, it is often desirable to cut through an open wound every soft tissue that restrains complete restoration, rather than depend upon their possible stretching under force. The first day is none too soon to resort to such operative procedures, but any time during the first month will usually suffice. In cases of the third degree, or in which correction cannot be accomplished without the employment of great force, more extensive operative procedures are necessary, and should be resorted to only after failure of tenotomy. In some cases I believe that early removal of the astragalus will enable the patient to adjust the muscles to the new circumstances and assist in developing them. The earliest age at which this is proper is, in my estimation, between the ages of one and two years. In cases that have been without treatment in infancy, or that have relapsed, numerous operations have been recommended and resorted to, the consideration of which is inappropriate in this paper.

I contend that it is not rational to wait until the doubtful assistance of walking can be had, because I believe that it is clearly proved that the earliest moment at which the deformed foot is thoroughly corrected the more satisfactory will be the ultimate result. During the period of one year or more spent in waiting for the child to walk the muscles will have adapted themselves in part to their abnormal positions; some will have become inactive and others over-active. This ultimate result, however, depends upon the completeness of the first correction, and as well upon the efficiency of the maintenance of the corrected position and the establishment of a correlation of muscular forces.

Relapses are the inevitable result of inefficiency on the part of those having the care or direction of the institution of the first remedial measures employed, and one of the prominent factors in these cases I have found to be delayed early correction. While it is improper to say that in all cases operative procedure should be resorted to or refrained from, I

<sup>1</sup> Bryant: *Prac. Surg.*, ed. 1884, p. 817.

<sup>2</sup> Stephen Smith: *Operative Surg.*, ed. 1887, p. 824.

<sup>3</sup> Wyeth: *Text-book on Surg.*, ed. 1890, p. 811.

<sup>4</sup> Moullin: *Treatise on Surg.*, ed. 1891, p. 355.

<sup>5</sup> Schrieber: *Wood's Med. and Surg. Monographs*, vol. ii, No. 3, p. 807.

<sup>6</sup> Parker: *Congen. Club-Foot*, ed. 1887, p. 85.

<sup>7</sup> Pye: *Surg. Treat. Common Deformities of Children*, 1889.

<sup>8</sup> Bradford: *Treat. Club-Foot*. *Trans. Amer. Orthop. Assoc.*, 1887, vol. i, p. 89.

<sup>9</sup> Vance: *Discussion*, p. 115 *Trans. Amer. Orthop. Assoc.*, 1889, vol. i.

<sup>10</sup> Hodgen: *Ibid.*

<sup>11</sup> Steele: *Ibid.*

<sup>12</sup> Keen and White: *Text-book of Surg.*, ed. 1892, p. 342.

firmly believe that the rule should be adopted, and without exception, that complete correction should be accomplished at the earliest possible moment—during the first month, if possible—and that this correction should be accomplished by the employment of every rational means, whether this be operative, mechanical, manipulative, or gymnastic; but to be effective it must be complete.

I believe that the soft bones of the tarsus will alter their shapes as they are squeezed and compressed by force, and leave the shortened tendons as much contracted as they were before, because we know that, except by tearing, tendons rarely if ever yield, while cartilaginous bones, not yet ossified, will yield to pressure. I believe that on making an examination of many feet corrected without operation, but for which operations were indicated, no elongation of the tendons would be found, but an altered external appearance of the foot due to the softened condition of the bones, squeezed into an external appearance of correction. At the earliest possible moment, therefore, we should employ any method that will be necessary to correct deformity and that will prevent a return to the deformed condition. The first correction, no matter by what means accomplished, is but the means to an end. It is not only correcting the appearance of the deformity, but it is the correction of the mechanical defect, so that the mechanical functions may be reestablished. The production of muscular atrophy, which is such a serious obstacle to the correction of club-feet after the period of infancy has passed, is a profoundly interesting subject, and I have but to refer to Chinese ladies' feet for evidence of what is too often done with club-feet.

The long-continued use of mechanical correction or restraining apparatus of any kind that does not provide for free ankle-motion will accomplish a muscle-atrophy just as successfully as the foot-binder. This muscle-atrophy is in turn followed by atrophy of the bones, not only in their diameter but also in their length. The natural tendency of a congenital club-foot is toward atrophy (from disuse) and increased deformity, and to avoid these we are, therefore, warranted in resorting to every means. The certainty with which, by judicious means, muscle-atrophy is corrected clearly indicates that if in congenital club-feet it cannot be entirely prevented, it can at least be arrested and controlled.

The length of time required to accomplish a full and complete correction of a congenital club-foot is the same as that required to form the foot of a normal child, and depends upon the age at which correction was obtained and the efficiency of the remedial measures employed. Not until the normally formed child is ten or twelve years old does the foot possess the normal mechanical conditions

necessary for its full usefulness. All babies are flat-footed, many are naturally pigeon-toed, but all these conditions pass off so soon as the correlation of muscular forces establishes the mechanical functions. The same may be said of a child born with a club-foot, certainly in the milder forms: that until the age of ten or twelve years the correction must be maintained mechanically, and efforts must constantly be made to develop the muscular system; the longer the delay in establishing the normal functions the less likely will those functions be normal.

That which in the normal child prevents the foot from becoming deformed, although it may be placed temporarily in a deformed position, is the correlation of muscular forces, and this can and must be established in cases of club-foot that are corrected sufficiently early. The absurdity must be avoided of resorting to gymnastic forms of treatment, and at the same time destroying their efficiency by the use of mechanical restraining apparatus that not only prevents the reproduction of the deformity but at the same time restrains all motion. Thus I have seen rigid plaster-of-Paris and rigid steel braces in constant use in a case in which it was removed for half an hour every day, and during that time developmental methods were employed. The trivial gain by manipulation was irrevocably lost by the employment of an apparatus that kept every part of the foot immovable.

To accomplish a complete recovery there must be an understanding of the mechanical functions to be recovered; this is apparently wanting in those who postpone the application of rational treatment, or who simply cut tendons and allow the case to relapse by neglect, or who consider braces to be curative. The diversity of views as to the existence of bone-malformation will in part account for the existing differences of opinions as to the propriety of resorting to operative procedures early in infancy. Druitt<sup>1</sup> believes that in some cases the astragalus is quite normal, proving that bone-changes are not necessary to talipes. Erichsen<sup>2</sup> says that very little alteration has taken place in the condition of the bones. Power<sup>3</sup> states: "I am, therefore, led to suppose that the deformity is due entirely to bone-changes." Ashhurst<sup>4</sup> says: "In most cases bones of the foot are not altered in structure." Adams<sup>5</sup> maintains that in cases of varus the astragalus is malformed from the moment of birth. Morton<sup>6</sup> says: "Bones, especially the astragalus, are greatly deformed and

<sup>1</sup> Druitt: *Modern Surgery*, edition of 1887, p. 491.

<sup>2</sup> Erichsen: *Science and Art of Surgery*, ed. of 1884, p. 579.

<sup>3</sup> Power, Arcey: *Trans. Path. Society, London*, 1888 and 1889, xl, p. 248.

<sup>4</sup> Ashhurst: *Principles and Practice of Surgery*, ed. of 1885, p. 686.

<sup>5</sup> Adams: *Amer. Surg. Association*, 1860, viii, p. 71.

<sup>6</sup> *Trans. Amer. Surg. Association*, 1890, vol. vii.

unrecognizable after excision." Phelps<sup>1</sup> states: "Deformity of soft parts out of all proportion to the deformity of bone."

I am convinced that to a very large extent the changes in the structure of the bones often described are in large measure due to postponement of appropriate treatment. This may be accounted for in either of two ways: First, that observed in uncorrected cases in which the process of ossification progresses and the partially dislocated tarsal bones become permanently deformed to suit the abnormal position of the foot; and, secondly, in those cases of more or less marked severity where, to stretch shortened tendons, there has been recourse to mechanical force. In these cases the bones, whether deformed or not, yield to the pressure exerted and thereby become deformed, and ossify in their altered shape. In most instances both of these occurrences could and should have been avoided by the early recourse to operative procedures. It is not a question of saving time, but of perfect correction.

In conclusion, I would offer the following:

That full, perfect correction should be obtained during the first month.

That if correction is possible without recourse to rigid restraining-apparatus, tenotomy should be avoided.

That when perfect correction cannot otherwise be maintained without employing undue force, tenotomy, syndesmotomy, or cutting of fascia, should always be resorted to in the first month.

That in infancy tenotomy should never be resorted to without being followed by developmental as well as restraining treatment.

That it is misapplied mechanics to force a club-foot into a rigid restraining-shoe, and that doing so in the first months of infancy will produce ultimate bone-deformity.

That all apparatus employed in infancy should facilitate free motion in the proper—i. e., normal—direction, and encourage the development of a correlation of muscular force.

All methods that employ undue force in correcting or restraining club-foot should be abstained from until the child reaches the age when the bones are completely ossified. The same period should be awaited before resorting to operations upon the bones.

#### ENLARGED TONSILS AND TONSILLOTOMY.

BY S. J. RADCLIFFE, M.D.,  
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ENLARGED tonsils are not always due to frequent attacks of acute or subacute inflammation of those

glands. They are often hereditary, and frequently congenital, as we find them in the first months of life or during early childhood, before any symptoms of acute inflammation have occurred.

In a table prepared by Mackenzie of 1000 cases seen by him at the Hospital for Diseases of the Throat, 84 were between one and five years of age, 181 between five and ten, or 265 under ten years; 382 between ten and twenty—or 26 per cent. under ten, 38 per cent. under twenty: in all, 65 per cent. under twenty; to which he adds that probably many of the cases in the earliest period were either congenital or made their appearance soon after birth.

Acute inflammation of the tonsil is rather likely to leave it atrophied, and it may be entirely absorbed after the first, the second, or the third attack, and there is no proof to sustain the assertion that the tonsils always remain permanently enlarged after an attack of tonsillitis—the result of thickening and induration of the parenchyma of the gland.

According to Mackenzie there can be no doubt that the tonsil is sometimes in a state of chronic inflammation, giving rise to permanent enlargement and multiplication of the constituent structures of the diseased part and to impairment of the function of the gland; but how often are we consulted in regard to these cases simply for the obstruction to respiration and deglutition, and the general discomfort caused by the enlargement, and not for any inflammation or pain intrinsically in the organ.

True hyperplastic enlargement of the tonsils is, without doubt, a diathetic disease, and arises from some constitutional fault, and most frequently that fault is exhibited in the form of struma—hereditary syphilis being also an important factor in the case. Though an attack of scarlet fever, measles, or diphtheria, or some other such microbic disease may apparently be the exciting cause in these cases, which appear later in life, there is the strongest probability that the groundwork of all such cases is in some constitutional taint.

The enlargement takes place at the expense of all the tissues of the gland—of the epithelial covering, mucous glands, lymphatic follicles, connective tissue, the vessels, and stroma. The enlargement occurs in the form of dilatation rather than induration—it is a hypertrophic dilatation and not enlargement with consolidation. It is not consolidation as in a fibrous tumor, firm and unyielding to the touch generally, but soft, elastic, and impressible. The hyperplasia or infiltration is due to caseation, to proliferation of diseased structure locally, *per se*, or to a general scrofulous diathesis, and is developed as in other tumid conditions of the lymphatic system, notably in the cervical region, as a local indication of a more general disease. With the enlargement the vessels become dilated

<sup>1</sup> New England Medical Monthly, February, 1891.



equally with the other portions of the structure—so much so, that while in a section of a healthy tonsil they may be almost invisible, in a section of the diseased gland they are easily seen, microscopically and macroscopically, with open lumen.

It is this dilatation of the whole structure of the gland, particularly of the vessels, that makes hemorrhage in tonsillotomy so immediately alarming. It is possible to occur in any case in proportion to the degree of dilatation. Hemorrhage in the cases noted cannot be considered to occur only in those cases of a hemorrhagic condition, in "bleeders" as they are called, but it is occasioned by or is the result of the enlarged, patulous vessels, giving a larger lumen or outlet, and freer exit to the stream of blood rushing to the gland from the internal carotid artery, and not usually, as many suppose, from severing of or injury to the carotid itself. Thus, while tonsillotomy may be a perfectly safe procedure in a non-strumous condition, it may be a dangerous, uncertain, or precarious one in persons in whom this diathesis coexists.

If we view the subject in this aspect, it would seem not to be difficult to distinguish the cases presented to us—those that might be, from those that might not be subjects for operation. This might be done by a minute inquiry into the history of the case, and a thorough subjective examination of all the symptoms presented or of all symptoms connected with the case, manifested or that may be elicited.

If the hypertrophy has existed from early childhood; if the patient has had uncertain or questionable health; if he has been subject to enlarged glands from slight causes, especially the cervical glands or the inguinal glands; if he looks pale, if his flesh is not firm, and if he is easily fatigued on moderate exertion—such information will help us in a measurable degree to make a diagnosis, and to decide in which of the categories to place the case and what remedial course to pursue. If, on the other hand, the enlargement is of more recent date; has occurred since manhood or adolescence, probably within the past few years, and following one or two attacks of violent acute inflammation in which the whole pharynx was involved, which had a definite course, but which only partially subsided after treatment, leaving the tonsils in a condition of subinvolution, with the pharynx still red and engorged; in a subject whose appearance indicates health and vigor, but who has been subjected to much exposure in cold and wet; or who has been addicted to excessive eating or drinking, resulting in a chronic gastric disturbance—we cannot go far wrong in viewing this picture in a very different aspect or in placing it in a position very different from the former.

Differentiating cases in this way, our therapeutic measures are of course made plainer, and we can see that while tonsillotomy would be proper and attended by no risk or apprehension of bad results in the latter group of cases, it would be, to say the least of it, imprudent, would incur great risk, and might be fraught perhaps with imminent danger to the patient in the former category. Having cognizance of all the surroundings, we can see at a glance that a line of reflection thus carried out leads us into the arena of operation fully prepared for any emergencies, and we need have no fear of present failure or unpleasant after-thoughts in regard to any misfortunes that may follow from misadventure.

It would follow, therefore, in view of the different conditions met with in enlargement of the tonsils, that tonsillotomy should not be performed indiscriminately, and the inference is apparent that the frequently sad, in some cases fatal results observed are the consequence of this indiscriminate and often hasty resort to operative means, taking the simple fact of the presence of so-called enlargement as a sufficient excuse for the procedure.

I do not know if this view of the subject has been generally thought over or has been considered worthy of serious reflection. In my opinion, however, the presentation of the matter, which is not at all strained, in its relation to diseased conditions and its association with complications that might be an index to its intelligent understanding and a guide in determining the amount or kind of remedial aid to be rendered, is in the line of progress, if it renders us more competent to deal with it and in a more rational manner.

#### THE TOXINES PRODUCED BY THE STAPHYLOCOCCUS PYOGENES AUREUS.

BY S. P. KRAMER, M.D.,  
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THE following is a report of the results of an investigation of the metabolic products formed by the staphylococcus pyogenes aureus carried on in the Biological Laboratory of the University of Cincinnati.

Two cultures were used; one kindly furnished me by Dr. Novy, of Ann Arbor, recently obtained from the blood of a child that had died of pyemia; the other a culture of two years' standing. No appreciable difference in result was recognized. A bouillon containing 1 per cent. of meat extract and 1 per cent. of peptone was used as a culture-medium. The germs were grown in Erlenmeyer flasks containing from 40 to 50 c.c. After remaining in the incubator at a temperature of from 35° to 37° C. for seven days, the cultures were passed

through Chamberland filters and the sterility of the filtrate established both by microscopic examination and inoculation upon agar.

This filtrate injected into rabbits produced no apparent symptoms. Thus, a rabbit weighing two pounds received 8 c.c. without effect. A daily injection of 2 c.c. during a period of seven days gave a similar result. This result was to be expected in view of the well-known resistance of the rabbit to this microorganism. The injection of four centigrams of the filtrate in the left forearm of the author was followed by marked local and general reaction. Five hours after the injection the temperature had risen from 98.4° to 99.8° F., pulse 96, accompanied by headache, pain in the back, flushing of the face, and general malaise. Locally, the point of injection was red, tender, and showed slight edema. Within the next eight hours the temperature returned to normal, some headache and malaise remaining during the succeeding twelve hours. The local inflammation increased during this time, but subsided completely after seventy-two hours, and was followed by slight desquamation. Another injection of 6 c.c. was followed by essentially the same symptoms, though to a less degree, a rise of temperature from 98.5° to 99°, pulse 90, slight headache, and a marked local inflammation.

From these experiments the conclusion was reached that the staphylococcus produced in its culture one or more chemical compounds which, when injected, gave rise to characteristic general symptoms and marked local irritation.

The next step in the investigation was the determination of the properties of these compounds, and, if possible, their location. When subjected to a temperature of 60° C. for half an hour the filtrate produced no general symptoms, even when large doses were injected. The local effect, however, remained unchanged. A quantity of filtrate was added to ten times its volume of absolute alcohol. A grayish-white precipitate resulted. This was allowed to settle to the bottom, the supernatant alcohol drawn off, and the precipitate repeatedly washed with 90 per cent. alcohol. After purification in this way the precipitate was dried in a vacuum at 33° C., and a light tan-colored powder was obtained.

This powder proved to be only partly soluble in water, but completely soluble in a 1 per cent. solution of sodium carbonate. A portion of this powder was then rubbed up with water and the insoluble portion separated by filtration. The filtrate was then thrown into ten volumes of alcohol; the resulting precipitate was re-dissolved and again precipitated with alcohol. After repeating this operation six times, and drying in a vacuum, a light grayish-white powder was obtained, albuminous in charac-

ter, which, when injected, produced a very slight local and no general reaction. Another portion of the original powder was dissolved in a 1 per cent. solution of sodium carbonate. The injection of this in very small doses, *i. e.* (1 mg.) produced a very marked local irritation.

In all these experiments control-injections of bouillon were made, with negative results.

The insoluble alcoholic precipitate gave the following chemical reactions:

The light, tan-colored powder was incompletely soluble in water and dilute saline solutions. When water was added the powder became a seal-brown flocculent mass. It was completely soluble in a 1 per cent. solution of sodium carbonate; insoluble in alcohol and ether.

It was precipitated from its solution by alcohol, mercuric chloride, ammonium sulphate, and acetic acid.

It gave the biuret reaction, and with Millon's reagent behaved like a proteid.

It was not precipitated by heat, nitric acid and heat, sodium chloride, or sodium sulphate.

By virtue of these reactions the body is to be classed among the albumins. To which particular variety it belongs is not at present apparent.

As the result of this investigation the following conclusions may be drawn:

The staphylococcus pyogenes aureus produces toxic albuminous products of two kinds:

1. A readily diffusible substance, difficult of isolation, very susceptible to heat and chemical reagents, which, when absorbed in the human system, produces symptoms of general disturbance.

2. A less diffusible albuminous substance, not very susceptible to a temperature of from 60° to 70° C., or to chemical reagents, which, when injected in the human subject, produces at the point of injection a well-marked inflammation.

Christmas, working in Pasteur's laboratory, was the first investigator to take up this point. He obtained from bouillon-cultures of the staphylococcus pyogenes aureus, by the addition of alcohol, a precipitate that produced suppuration when injected in the anterior chamber of the eye and subcutaneous tissue of rabbits.

In the same way Brieger and Fraenkel obtained a toxalbumin insoluble in water, which proved fatal when injected in rabbits or guinea-pigs. On post-mortem examination of such animals they found the following changes: Intense inflammation at the point of injection, with swelling and reddening of the neighboring tissues; at times a purulent necrosis at the point of injection, which in some cases extended through the abdominal wall and gave rise to an antiseptic purulent peritonitis. The amount of toxalbumin injected by these authors is not

stated, but it must have been a very large quantity in order to produce such grave changes. I should judge that in these experiments the animals were killed by the violence of the local insult rather than by the absorption of any general toxic product.

My investigation would lead me to believe that the rabbit is proof against the general toxine produced by this germ, and that, moreover, the chemical operations employed in endeavoring to isolate it would destroy any toxic properties that it may have possessed.

There is one other point to which I desire to call attention—the therapeutic possibilities offered by these substances. If we take the sterile filtrate of staphylococcus cultures, and heat it for half an hour at 60° C., we have an irritant that I think will prove of considerable value. We have a counter-irritant that, when injected in very small doses, produces a well-marked irritation; in larger doses, almost a true erysipelatous inflammation. There are no dangers of general disturbance attending its use, there is no abrasion of the surface to become infected, and the effect to be produced is thoroughly within control.

If a  $\frac{1}{2}$  per cent. of carbolic acid be added to it the fluid will keep indefinitely, or, better still, a 1 per cent. solution of the alcoholic precipitate in 1 per cent. sodium carbonate solution could be used. Such solutions would be of great value, both as counter-irritants and as a means of hastening supuration in furuncles, etc.

If, on the results of these investigations, it is permissible to construct a theory of suppuration as produced by the staphylococcus, it would be briefly as follows: The staphylococcus, during its growth in the tissues, produces a toxine that, when absorbed, gives rise to the general symptoms attending a local suppurative process. Furthermore, it produces a toxic substance that is highly irritant, and that possesses a strongly positive chemotaxis for the leukocytes. The duty of the local leukocytosis is twofold: First, by virtue of their phagocytic properties the leukocytes restrain the growth of the germ, and secondly, the local necrosis caused by their effusion enables the organism to discharge the bacteria, toxic products, and necrotic tissue present.

## CLINICAL MEMORANDA.

### REPORT OF TWO CASES OF PUERPERAL FEVER.

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THERE is probably no disease so dreaded, alike by the profession and by the laity, and that has so vigor-

ously resisted the assaults of thoughtful physicians, as childbed fever. It is not my purpose in this paper to attempt an exhaustive article on this subject, but simply to illustrate, by the aid of the cases that I have selected, the indications to be combated in the treatment, and how to meet them.

Acknowledgment of my indebtedness is due to Professor C. A. von Ramdohr, who, by his valuable counsel and timely suggestions, first led me to investigate this matter.

CASE I.—Jane R., aged twenty-one years, a primipara was born in the United States; her condition during pregnancy being excellent. The presentation was cephalic, and all the pelvic measurements were diminished three-quarters of an inch. She was delivered by forceps April 17th, after having been in labor twenty-one hours and twenty minutes. The indications for interference were as follows: Head engaged and stationary for three and a half hours; pains frequent, paroxysmal, but powerless; the fetal heart—which was heard on the left side four inches below the umbilicus near the median line—becoming arrhythmic, and rapidly increasing from 140 to 180 pulsations per minute. The operation was performed under careful antisepsis, though the customary ante-operation vaginal douche was, by some mistake, omitted. There was a successful delivery of a living male child. The mother did well until the fifth day (April 23d), when, toward evening, she was seized with rigors, followed by a rapid rise in temperature to 102.6°; with a pulse 88, full, and bounding. The urine was high-colored and small in amount. The lochia were arrested, but there was no fœtor. On careful palpation, there was no evidence of metritis or perimetritis. Some tympanitic distention existed; the tongue was heavily coated; there was frontal headache, and the face was flushed; the skin was hot and dry. Calomel (gr. v) was given, followed by dram-doses of magnesium sulphate every hour until free catharsis resulted. A milk-diet was prescribed. Quinine sulphate gr. xx, in a single dose, was given, to exclude the possibility of the fever being of malarial origin.

On April 25th I was asked to see the patient by my colleague, Dr. Gibbs. At that time her morning temperature was 104° in mouth; pulse 92 and compressible; a chill had recurred, and the expression was anxious; the tongue dry and very heavily coated. Still there was no evidence of local inflammation. The lochia were completely suppressed, though the involution had progressed correspondingly with the period of the puerperium. I had no doubt as to the case being one of general septicemia. The bowels had been moved freely by salines. No distention or tenderness of the abdomen was present. A vaginal douche of carbolic acid (5 per cent.) was given, and I advised whiskey,  $\frac{f\text{ }3ij$ , every hour until the desired effect—i. e., lowered temperature, improved pulse, skin and tongue becoming moist, was produced.

On April 24th, P.M., the temperature was 102.6°; the pulse 88, compressible; the tongue moistened about edges, but coated. Urination and watery movements had taken place. There was no tenderness over the uterus. The treatment was continued.

On April 25th, noon, the patient was seen by Dr. von



Ramdohr. The treatment was approved and continued. The patient looked more cheerful. The temperature was 100°, the pulse 100, very compressible; the tongue and skin moist.

On April 25th, 10 P.M., the temperature was 99.8°; the pulse 95, volume improving. The milk-diet was continued. The quantity of whiskey was reduced one-half.

On April 26th, the countenance was cheerful; the tongue clean and moist; the pulse 69, of good quality; the temperature 99°; the lochia reappearing, and without odor. There was no tenderness of the uterus. The whiskey was diminished to f3j every three hours, and the milk-diet continued.

On April 27th, the patient was still improving rapidly; the pulse and temperature were normal. The diet was increased and stimulants were stopped.

On April 29th (eleventh day) the patient sat up for two hours.

CASE II.—Maria M., a primipara; born in the United States. There were umbilical hernia the size of an egg, and varicose veins of the legs and labia. Her condition during the present pregnancy was very poor from the effects of influenza last January, and improper and insufficient food.

This patient was delivered by Dr. E. D. Gazzam, on June 16th, by version. The indications for interference were as follows: The mother's temperature was 103.6°; pulse 140, dicrotic. There was inertia of the uterus: the head was not engaged; the os uteri was the size of a "double silver dollar." Here, again, most perfect antisepsis as to the operator's hands, arms, patient's external genitals, etc., was carried out, but the ante-operation vaginal douche was again omitted. A living male child was delivered. The mother's pulse was 116, of poor quality; the temperature 103° at the close of the operation.

On June 16th, at 11 P.M., the countenance was pale and anxious. Urination was practised in the recumbent position. The temperature was 99.8°; the pulse 92, rhythm and volume improved; after-pains existed and there was tenderness over the uterus. Milk-diet was ordered, and f3ss of whiskey every three hours.

On June 17th, at 4 P.M., the countenance was pale but contented; she had slept two hours, and urinated; the lochia were free and sweet; the uterus was six inches above pubes; the temperature 99.8°; the pulse 84. Milk-diet and stimulants were continued.

On June 18th, at 9 A.M., the countenance was anxious. She had urinated and the bowels had moved. She had slept four hours; the temperature was 103.4°; and the pulse 120. The breasts were not secreting. The uterus was just below the umbilicus. Whiskey f3j was given every hour.

On June 18th, at 3 P.M., the temperature was 104.4°; the pulse 140, very compressible, and of small volume; the tongue dry and coated; the facial expression anxious; there was headache; restlessness; the skin was hot and dry; the lochia suppressed; upon careful palpation no signs of local inflammation were present, except tympanitic distention of slight degree. I advised free catharsis by calomel, followed by dram-doses of magnesium sulphate every hour until a free watery move-

ment was obtained, and that the amount of whiskey be increased to f3ij every hour.

From this time convalescence began, and on June 27th the patient was sitting up and gaining strength.

From the foregoing cases, selected because of their typical histories, coupled with many other experiences, I draw the following conclusions:

First. That there are two forms of puerperal fever: sapremia, a local condition due to retained membranes, placental tissues, blood-clots, etc.; in which, because of exposure to the bacteria of putrefaction, ptomaines are developed, setting up a local inflammation. The other form is general septicemia, and occurs usually after the fourth day. This is a general condition, with few, if any, local manifestations, and is due to the absorption of the pus-organisms. This latter class of cases is illustrated by the foregoing histories.

Second. That septicemia will and does occur even when the most careful attention has been paid to the hands of the operator, instruments, and external genitals; from dislodgment of the bacteria in the vagina, either by hands or instruments, and so removing them from an acid secretion which renders them harmless to the alkaline secretion of the cervix, which acts as a culture-medium.

Third. That, in my experience, septicemia can be prevented, even after the most difficult forceps-applications and prolonged versions, by absolute antisepsis of the operator's hands and instruments; and, preceding the introduction of the hand or instrument into the uterus, by hot vaginal douches of mercuric chloride (1:3000) or creolin (2 per cent.). Again, after any form of instrumental interference whatsoever, it is my custom to throw into the uterus large quantities of carbolic solution (5 per cent.), or creolin (1 per cent.), having a temperature of from 105° to 110° F.; followed by plain hot water, and using a fountain syringe; and of late I have been leaving from 30 to 40 grains of iodoform in the shape of pencils, within the uterus, thus insuring continued asepsis. Another suggestion that is worthy of consideration in cases in which sepsis is feared is the use of copious hot enemata of Rochelle salts, or soap-suds immediately after labor, depleting the pelvic organs, and, consequently, proving valuable adjuvants in the prevention of sepsis.

Fourth. That in our treatment of septicemia, local interference, such as continuous irrigation of the uterus, is of little or no value, as there is a general infection, not a local inflammation. Pyrexia and asthenia are the conditions to be combated; therefore, our treatment must be general, not local, as in cases of sapremia. Whiskey, or any form of alcohol, in heroic doses will meet both these indications. The temperature will drop, the pulse improve in quality and diminish in frequency, the tongue and skin will become moist, and restlessness will diminish.

Fifth. That free catharsis with salines is a most important aid in the management of these cases, by reducing the temperature and relieving the congestion of the pelvic organs and peritoneum, which frequently exists.

In conclusion, let me say that septic fever in my opinion, is a preventable accident. Physicians too frequently ignore their responsibility, but the trouble can always be traced to some slip in the technique.

**PURPURA RHEUMATICA FOLLOWING ACUTE SUPPURATIVE MASTITIS.**

BY IRVING M. SNOW, M.D.,

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THE following case of purpura rheumatica is of especial interest, for although its clinical picture corresponds very closely with that of the peliosis rheumatica of Schoenlein, yet the circumstance that acute articular pain and swelling and extensive subcutaneous hemorrhage appeared immediately after acute suppuration in the left mammary gland, point rather to the conclusion that the joint-symptoms and purpura were due to an acute microbic infection, and were not merely one of the phases of the rheumatic diathesis.

From the history of the case it would seem reasonable to infer that the same pyogenic bacteria that were responsible for the mammary inflammation, also gave rise to the series of symptoms to be narrated.

The patient, Miss R., was a spinster of seventy, an inmate of a home for old women. Her father and brother had suffered from rheumatic fever. She had herself had pain in the left hip-joint twenty-five years before, and in 1890 her left knee was swollen and tender for a few days.

In 1887, at the age of sixty-five, an acute abscess, of apparently spontaneous origin, developed in her left breast. The abscess was opened, and several ounces of pus were evacuated. Nevertheless, after the incision healed there remained in the upper and inner quadrant of the breast a considerable area of indurated glandular tissue, and from the left nipple there oozed a thin, purulent discharge, which, in time, gave rise to an eczema of the nipple and the adjacent skin. The left breast was the seat of a chronic abscess, with a sinus terminating at the nipple.

The patient was a stout, robust woman, of good temper and digestion. Her sight was imperfect from optic atrophy; but, excepting this, she had suffered little from senile decay.

She was, nevertheless, very much annoyed by the itching of the eczema of the nipple, and was tormented with the idea that the hard mammary lump was a carcinoma of the breast. As she utterly refused to have the breast laid open and the abscess evacuated, and was urgent for relief, I directed the nurse of the institution to syringe out the sinus once a day with a 50 per cent. solution of hydrogen dioxide.

This treatment was commenced on March 25, 1892. In a few days the woman began to complain of languor and dyspnea, and the breast became swollen and painful. On March 29th an abscess had formed in the inner half of the breast, which was now opened, and the abscess-cavity was irrigated with a boric-acid solution. A large area of indurated glandular tissue remained after the evacuation of the abscess-cavity.

For the next two days the patient was comfortable.

On April 1st she complained bitterly of pain in her lower extremities. Her toes, insteps, ankles, and knees were very much swollen. The tissues about the feet were the seat of a tense subcutaneous edema. The slightest movement of the ankles and knees caused the most intense anguish. I also found the feet, legs, and the pos-

terior and external surfaces of the thighs thickly sprinkled with bright crimson spots, about a third of an inch in diameter. These discolorations did not disappear on pressure, did not itch, and were evidently hemorrhagic in character. There were no chills, no sweating. The temperature was 98.5°, the pulse 70.

Associating the articular swelling and purpura with the acute mastitis, and remembering with remorse that my antiseptic had been far from ideal, I imagined at first that I had to deal with a case of pyemia, with metastatic abscesses, an apprehension that subsequent events quickly dispelled. Quinine and iron were prescribed.

On April 2d the temperature was 98.5°, the pulse 70. There was no pain in the breast, but considerable discharge from the incision. The swelling and edema about the joints were much diminished. The purpuric spots remained unchanged. The ankles and knees were very painful.

I did not see the patient on the next day.

On April 4th the temperature was 99.5°, the pulse 90. The pus-cavity was still discharging. There was no epistaxis or tenderness of the gums. There was no pain or swelling of the knees or ankles. The dorsum and wrist of the left hand were, however, swollen and painful.

The woman was given large doses of sodium salicylate and sodium iodide.

After this, for several days, her condition improved in many respects. By April 6th the joint-pains had entirely ceased; the edema and swelling had disappeared, although the skin about the joints remained loose and flabby, from the rapid absorption of the effusion.

Coincidentally with this amelioration in the general condition, the induration and discharge from the mammary abscess became insignificant.

From April 6th to 9th there was an absence of all symptoms; the purpuric spots had faded. On April 9th the patient felt able to walk about her room. This was, however, but a deceitful lull before a second and more severe attack.

On April 10th the woman was seized with vomiting and diarrhea; the stools were dark and watery. The sodium iodide and sodium salicylate were immediately withdrawn and bismuth subnitrate substituted.

On April 11th the patient continued to have numerous loose passages. The temperature was 98.5°, the pulse 90. The symptoms of purpura rheumatica again appeared. Both ankles and knees and the right wrist were swollen. About all of these joints, the feet and the hand, there was a tense edema, resembling the puffiness of dropsy, excepting that pressure left no indentation on the surface. The skin of the legs, thighs, and buttocks was sprinkled with innumerable livid blotches and papules about the size of peas. The patient seemed in great distress from the pain and tension of her joints.

On April 12th the patient was decidedly worse, sitting up in bed and groaning continually. The temperature was 99°, the respiration was 36, the pulse 100, full and receding. Her face was of a pale-grayish hue; the lips livid; the tongue was covered with a moist, brown coat. The swelling, edema, and pain in all of the affected joints, and in the subcutaneous tissues about the articulations, had become enormous. On the dorsum of the right hand were a few purpuric blotches. On the lower

extremities, in addition to the purpuric macules and papules that appeared on April 11th, there were large hemorrhagic discolorations, two or three inches in diameter, on the thighs, in the gluteal regions, and on the back. In fact, the skin in these regions was three-fourths covered with livid blotches, indicating that an extensive subcutaneous effusion of blood had taken place. The patient was given ergotin gr. j., morphine gr.  $\frac{3}{16}$ , every hour, and whiskey  $\frac{3}{4}$ iv, every three hours.

On April 13th, the woman slept well during the night. All pain, swelling, and edema had subsided; only the right tendo Achillis was still somewhat puffy. The livid hemorrhagic spots had become brownish in color. The temperature was 98.5°, the pulse 92, quick and receding. At the apex of the heart, and also at the second right intercostal space, a soft, systolic murmur could be heard. The gums were slightly painful when the teeth were pressed together.

On April 14th the temperature was 98.5°, the pulse 84. There was no pain or swelling in any joint, and the purpuric spots were fading.

From this time, Miss R. made a rapid and complete recovery, with no recurrence of the purpura or rheumatism. The cardiac murmur persisted for about two months, being probably caused by an endocarditis, as the patient quickly rallied and suffered neither from prostration nor anemia.

It is to be noted that the illness lasted fourteen days; that during this time there was neither chill, sweating, fever, nor albuminuria. Further, that the articular symptoms, pain and swelling, were identical with those of acute rheumatism, shifting from one joint to another. I have, however, never seen such extensive, tense edema about a rheumatic joint.

The purpura seemed part of the general systemic infection, appearing not only on the lower extremities but also on the right hand. The pain in the joints did not abate when the hemorrhage ceased, but continued to a distressing degree for a day or two afterward.

As to the nature of the joint-effusion in purpura rheumatica, it has long been settled that this is serous and not hemorrhagic. The swelling of the joints in the case reported disappeared in twenty-four hours—an impossibility if there had been blood effused into the joint.

It must be remembered that the recurrence of the articular pain and swelling, and the purpura, was preceded by an interval of three days of apparent health, during which the patient walked about. Perhaps the patient's imprudence in leaving her bed and walking about might explain the severity of the second attack.

Purpura rheumatica is described by Schoenlein as purpura occurring in a rheumatic subject. In our case there was certainly a family history of rheumatism, yet the patient herself had passed seventy years with but slight evidence of a rheumatic diathesis.

The pathology of both rheumatism and purpura, whether they exist separately or together, is still obscure. Why, in a certain number of cases, the clinical picture of acute articular rheumatism should be so changed that the important symptoms of fever and sweating should be lacking, and be replaced by recurring hemorrhages under the skin, is a question that is unsatisfactorily explained by Schoenlein.

With Miss R. the sequence of swelling of the joints

and purpura upon acute suppuration in the breast was too close to be mere coincidence. We have first, as a result of irritating injections, an acute glandular abscess, due undoubtedly to bacterial infection. In connection with the development of the abscess the patient has an attack of purpura rheumatica. It is to be regretted that no bacteriologic examination was made of the blood, yet the conclusion is irresistible that the whole illness, swollen joints and subcutaneous hemorrhages, was due to a general microbic infection from the suppuration in the left mammary gland.

371 PORTER AVENUE.

## HOSPITAL NOTE.

### A CASE OF TRANSPPOSITION OF THE VISCERA.<sup>1</sup>

BY ALFRED HAND, JR., M.D.,

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THE patient, M. H., female, aged eight years, was admitted August 12th. Her illness began one week before admission, with evening fever. On admission she was very weak, and had a temperature of 102.2°. Examination revealed a lobar pneumonia, involving both lower lobes. The dulness on percussion was marked on both sides posteriorly; on the left it extended around the side and in front, from near the nipple to the costal border (L in the illustration), covering the area in which the tympany of



the stomach is usually found; the dulness on the right, posteriorly, was not of large area and did not extend anteriorly, the usual area of liver-dulness being tympanitic (T in the illustration).

The apex-beat was felt in the fifth interspace, just within the nipple-line of the right side, too low down for that of a heart displaced by a left pleural effusion. The existence of an effusion was also excluded by the clear signs of pneumonia. There was *distinct* bronchial breathing over an immovable area of dulness, corresponding with the lower lobes of the lungs, with vocal resonance and fremitus increased. Further, the liver could be palpated just below the edge of the ribs on the

<sup>1</sup> Service of Dr. Arthur V. Meigs.



left. The case also presented the typical pneumonic flush over the cheek-bones. The fever ended by crisis on the third day after admission; the *râle crepitans* *redux* and the sub-crepitant râles of resolution were soon heard, and the patient was discharged cured eighteen days after admission. She has since been kept under observation, all signs of the pneumonia have disappeared, and repeated examinations have shown clearly that the viscera are transposed. The child apparently suffers no inconvenience from the abnormality, as she is now in very good health.

## MEDICAL PROGRESS.

*Symptoms like those of Cholera from Streptococci.*—BECK (*Deutsche medicin. Wochenschr.*, 1892, No. 40, p. 902) has reported the case of a woman, forty-four years old, who, at a time when cholera was not prevalent at Hamburg, but was being looked for, presented symptoms quite indistinguishable from those of true cholera. The stools were, however, of acid reaction, and the presence of cholera-bacilli could not be determined, either by microscopic examination or by culture-tests. Only streptococci could be found. The case progressed to a fatal termination. At the autopsy rigor mortis was marked, and the muscles on section appeared dry. The spleen was small and soft. The liver was anemic, but otherwise unchanged. The stomach contained thin, yellowish-brown, feculent liquid. The mucous membrane was pale, but at the fundus was a small area presenting minute hemorrhages.

The mucous membrane of the duodenum was intensely red at the summits of the folds of the bowel, the redness becoming gradually less pronounced, and ceasing at about the middle of the small intestine. Peyer's patches and the solitary follicles were not perceptibly swollen. The contents of the bowel consisted of thin, yellowish-brown, bile-stained, pea-soup-like liquid. The cecum and large bowel presented no changes. The mesenteric glands were small and pale. Bacteriologic examination of the blood taken from all of the organs disclosed the presence of comparatively thick and long streptococci, resembling those cultivated from the stools. The organisms proved pathogenic to mice, in whose blood they could be found. The organisms grew in bouillon, rendering the culture-medium turbid, and forming long filaments. On agar they formed fairly large, flat colonies. They grew in gelatin beneath the surface, forming chains. The contents of the gastro-intestinal tract were examined for arsenic, but none was found.

*Implantation of the Ureters into the Rectum.*—As the outcome of an experimental study, REED (*Annals of Surgery*, vol. xvi, No. 3, p. 193) concludes that unilateral implantation of the ureter into the rectum is a possible and a practical surgical procedure. Bilateral implantation of the vasa deferentia into the rectum is not followed by any serious or detrimental results, further than the induction of sterility. Simultaneous implantation of both ureters into the rectum is still a questionable surgical procedure. The presence of the urine, with the feces, in the rectum does not occasion pathologic irritation of the latter. The passing of frequent liquid stools

cannot be considered as resulting from the implantation of the ureters into the rectum, with the presence of urine in that part of the bowel. It is probable that a portion of the water of the urine passed by the bowel is absorbed, leaving the salts to be eliminated with the feces. The ligation of one ureter and the consequent production of hydro-nephrosis is not necessarily followed by inflammation and destruction of the wall of the ureter or of the substance of the kidney; it may be that the secreting function of the kidney is arrested or that the natural physiologic process of elimination is reversed, so that absorption takes place.

*Cerebellar Hemorrhage in a Boy.*—BARLING (*Birmingham Medical Review*, October, 1892, p. 223) has reported the case of a boy, ten years old, who, it was stated, had fallen a distance of four feet. The boy appeared faint and collapsed. He complained of great pain in the left side of his head, but could give his name. Subsequently his face became blue and his breathing infrequent and shallow. Life was sustained for a short time by artificial respiration, the heart continuing to beat; but death eventually ensued. At the autopsy there was no external evidence of injury to the skull, no hematoma, no fracture. On opening the calvarium and removing the dura mater, the pia was seen to be slightly congested, with slight hemorrhage in the course of the vessels. There was also slight hemorrhage into the membranes over the pons and medulla. The fourth ventricle was filled with clotted blood, which extended into the third and lateral ventricles. The middle lobe of the cerebellum was torn up by an extensive hemorrhage that in less degree involved the lateral lobes as well. The vessels at the base of the brain were healthy and there was no aneurism or thrombosis to be detected. All the other organs appeared normal.

*A Fatal Case of Gonorrheal Septicemia.*—RUGG (*Lancet*, No. 3605, p. 772) has reported the case of a man, sixty-two years old, who presented himself on the third day of an attack of gonorrhea, which responded to astringent and antiseptic injections. Two days later there was complaint of pain in the back; on the following day there was great pain at the right wrist, shoulder, and knee, and pain of less degree upon the left side; later in the day the right wrist became inflamed and much swollen, and there was considerable effusion into the right knee, without redness. The left ankle became red and swollen, and the left wrist painful but not swollen. The soles of the feet were painful to touch. The conjunctivæ and sclerotics were injected. The patient was given potassium iodide and opium, and appeared to improve. On the tenth day after the discharge had begun he became somnolent, then comatose, and finally died, the temperature rising to 107° an hour before death.

*Anus Preternaturalis.*—To obviate the difficulties attendant upon suture of the bowel in the establishment of an anus preternaturalis, CHAPUT (*Archives Gén. de Médecine*, October, 1892, p. 442) recommends the substitution of *serre-fines* or hemostatic forceps for sutures. After the induction of local anesthesia by injections of cocaine, the necessary incision is made and the bowel

is brought out of the abdominal cavity with a pair of artery-forceps; eight serre-fines or hemostatic forceps now grasp the bowel, the peritoneum, and the deep layer of muscle at as many points. The loop of bowel is irrigated with a solution of zinc chloride 1:10, and an incision of three-fifths of an inch is made in it. The lips of this incision are kept apart by a catgut suture on either side, and an antiseptic dressing is applied. The hemostatic forceps or serre-fines are removed at the end of twenty-four hours. The method has been successfully employed in four cases.

**Death from the Presence of Ascarides in the Bowel.**—HILLYER (*Lancet*, No. 3605, p. 773) has reported the case of a girl, five and a half years old, who, previously in good health, had the day before complained of severe abdominal pain. A dose of castor oil was administered but at once rejected, together with three round-worms. The bowels failed to move, but the vomiting was not repeated. It was not known that worms had been previously passed. The child lay on her back, half-unconscious, moaning occasionally, with eyes wide open and pupils dilated. The conjunctivæ were almost insensitive; the skin was cold and clammy; the temperature, taken in the rectum, was 99.8°; the pulse was imperceptible at the wrists; the apex-beat of the heart was fluttering and difficult to count. Three grains of santolin and three grains of calomel were administered, but the child died ten minutes later. At the post-mortem examination, the small intestine was found slightly distended down to a point fifteen inches above the ileo-cecal valve, where a collection of forty-two round worms was found, eight of which, were rolled together in a solid mass, occluding the bowel. There was no perceptible narrowing of the gut at this point, and no intussusception. The mucous membrane of the bowel was intensely congested. The peritoneum covering the small intestine was slightly congested in patches. The opinion is expressed that the symptoms and the fatal termination were dependent upon the irritation occasioned by the presence of the worms, rather than upon obstruction caused by them.

## THERAPEUTIC NOTES.

**The Treatment of Dysentery.**—GRUET (*Bull. gén. de Thérap.*, No. 28) recommends the employment of sodium sulphate, in conjunction with intestinal antiseptics, in the treatment of acute dysentery. Two drams and a half of the salts, in six ounces of water, together with seven and a half grains of naphthol, are taken in four doses in the course of twenty-four hours, at intervals of three hours. The treatment is to be continued until the stools have resumed their normal character and consistency. If the naphthol is not well borne it may be replaced by salol in suitable doses. At the same time the bowel is irrigated with a 2 per cent. solution of boric acid, followed by naphthol, 1:4000, or carbolic acid, 1:2000. The injections should be continued for a week after all the symptoms have been absent.

**Infusion of Pilocarpus for Hiccough.**—NOBEL (*Centralbl. f. klin. Medicin*, No. 32) has reported the case of a soldier, twenty-one years old, with extensive bronchitis following

influenza, in which severe and obstinate hiccough suddenly set in, so that the man became almost exhausted and cyanotic. The symptoms were speedily relieved by the administration of an infusion of the leaves of pilocarpus, five parts to two hundred of water, taken almost *ad libitum*.

### For Acute Coryza.—

R.—Acid. tannic. . . . . gr. iij.  
Acid. salicylic. . . . . gr. vj.  
Salol . . . . . ʒss.  
Acid. boric. . . . . ʒij.—M.

S.—At the onset of the attack, a pinch should be snuffed in each nostril every hour for not longer than twelve hours. If it be desired to continue the treatment, talc or more boric acid should be added, or the proportion of salol reduced half or quarter.

CAPITAN, *L'Union Méd.*, No. 116.

### For Ozena.—

R.—Acid. thymic. . . . . gr. vj.  
Acid. salicylic. . . . . gr. xv.  
Acid. boric. . . . . ʒjss.  
Salol . . . . . ʒijss.  
Pulv. talc . . . . . ʒiv.—M.

S.—As a nasal insufflation after preceding irrigation with carbolated water. *L'Union Méd.*, No. 117.

**The Treatment of Ozena.**—At the recent meeting of the French Society for the Advancement of Science MOURE reported the successful employment in a considerable number of cases of ozena, by means of sprays, of a 10, 15, or 25 per cent. solution of argentic nitrate and of zinc chloride, from 2 to 10 per cent. The spray is to be employed daily, or on alternate days, in accordance with the severity of the disease.—*Wiener medicin. Presse*, 1892, No. 41, p. 1640.

**For Typhoid Fever.**—RICHARDSON (*Asclepiad*, 3d quarter, 1892, p. 255) recommends:

R.—Methylene bichloride . . . . . ʒj.  
Solution of hydrogen dioxide (10 volume) . . . . . ʒj.  
Dilute hydrochloric acid . . . . . ʒxxx.  
Distilled water . . . . . ad ʒvj.—M.

S.—A tablespoonful every three hours.

### For Hemorrhoids.—

R.—Iodi pur. . . . . gr. iv–xvj.  
Potassii iodidi . . . . . ʒij.  
Glycerini . . . . . ʒj.—M.

S.—Apply topically every three or four hours by means of absorbent cotton, after having previously taken a hot sitz-bath. PREISMANN, *L'Union Méd.*, No. 112.

**Phenacetin as a Topical Application.**—LEE (*Memphis Med. Monthly*, 1892, No. 10, p. 481) reports the successful employment of phenacetin in powder as a topical application to ulcers of various kinds. It is thought the agent acts as an anesthetic, an antiseptic, and a stimulant.

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## THE DIFFERENTIATION OF GLUCOSE FROM OTHER ALLIED CARBOHYDRATES OCCURRING IN URINE.

It would seem that the life of the clinician who would attempt to keep at all abreast of the times must be devoted largely to the unlearning of things that he has been taught to regard as unassailable facts. Verily, *Difficultatem facit doctrina*.

It is not so very long since it became generally known that glycosuria frequently exists independently of diabetes, just as albuminuria as often as not has its origin in lesions other than renal. And, while nowadays nearly every practitioner is conversant with the ordinary reduction-tests that are used for the detection of the presence of grape-sugar in the urine, there are probably few that appreciate sufficiently well the fact that other allied carbohydrates at times occur in the urine which are just as capable of reducing the metallic salts as is glucose. The numerous sugars of the glucose group are chemically aldehydes, and the power of reducing ammoniacal solutions of silver salts and of cupric compounds is not peculiar to glucose or to the glucose series, but is a property common to all those chemical bodies that contain the particular atomic grouping characterizing the aldehyde molecule.

The differentiation of these sugars by the more

delicate methods of the chemical laboratory would be scarcely practicable for the every-day physician, so that the need of a series of simple tests that will enable him to decide in any given case whether he is dealing with glucose, maltose, or lactose, becomes at once apparent.

The familiar test of TROMMER is perhaps the easiest to apply as an ordinary procedure when it is suspected that the urine may contain sugar, but it can only be regarded as *safe* for glucose when the precipitation of cuprous oxide occurs *before* the solution boils. The bismuth test of BÖTTGER, especially with NYLANDER's modification, is sharp and usually safe, but cannot be relied upon if the urine contain albumin, melanin, melanogen, or the coloring matter of rhubarb.

The fermentation-test deserves to be more widely used than it is at present, as it is easily carried out with the aid of the small tubes devised by SALKOWSKI, EINHORN, and MORITZ. If one obtain a positive result there is evidence of the presence of some body that is capable of undergoing fermentation; but this may be glucose, galactose, maltose, or levulose; or if the yeast contain fission-fungi, the uric acid may be split up with formation of carbon dioxide as one of the end-products.

The phenylhydrazin test, as first applied by VON JAKSCH, has been steadily gaining favor, and recently with certain additions has been recommended by its originator as one of the best means of differentiating between the members of the glucose group (*Prager med. Wochenschr.*, 1892, No. 31). Glucose forms with phenylhydrazin an insoluble combination, to which FISCHER has given the name phenylglycosazon, a compound that crystallizes in characteristic, yellow, radiating needles, which have a melting-point of 205° C. The test is by no means so difficult as at first appears, and is already used by many clinicians in this country.

VON JAKSCH claims that the combined use of the tests of TROMMER and NYLANDER, supplemented by the phenylhydrazin reaction, with determination of the melting-point of the crystals obtained, and by the tests of fermentation and polarization, will suffice to demonstrate the presence of even minute quantities of sugar, and also to decide as to the particular kind present.

In certain diseases of the pancreas maltose has been found in the urine. This body deflects the ray of polarized light more strongly to the right than does glucose, and, furthermore, is distinguished



by its property of reducing the metallic salts when sulphuric acid is added and the mixture warmed; besides, the maltosazon crystals that are formed when the phenylhydrazin test is applied have a melting-point  $16^{\circ}$  lower than those of phenylglycosazon, and on microscopic examination are quite different in appearance.

Milk-sugar in urine reduces the copper and bismuth salts, but is easily recognized in that, with the fermentation-test, the reaction is negative, or only feebly exhibited, while, with the quantities in which milk-sugar is found in urine, no crystals of phenyl-lactosazon are formed. Should they be formed they may be distinguished by their microscopic appearance and by their melting-point, which is  $200^{\circ}$  C.

Levulose or fructose reacts in every respect as does glucose, except that it deflects the ray of polarized light to the left.

The peculiar sugar described by LEO presents no difficulties in differentiation, as there is a difference of 1.6 per cent. in the results obtained by titration and polarization. Again, this body does not undergo fermentation, has feeble reducing powers, and, moreover, forms a fluid combination with phenylhydrazin.

Another point is of interest. One sometimes meets with urine poor in dextro-rotatory glucose, and rich in levo-rotatory  $\beta$ -oxybutyric acid, and in such a case the deflection to the right by the glucose may be neutralized or even more than compensated for by the action of the acid.

If a urine of this kind has responded to all other tests for glucose, the appearance of a more or less marked deflection to the left after fermentation is sufficient, aside from all special tests for  $\beta$ -oxybutyric acid, to demonstrate the presence of a dextro-rotatory substance capable of undergoing fermentation, this substance being in all probability glucose.

The test of BAUMANN, which depends upon the precipitation of the carbohydrates with benzoyl chloride and potassic hydrate, is regarded by VON JAKSCH as unsatisfactory and impracticable, partly on account of the confusing furfural color-reactions, and partly from the difficulty of obtaining the pure sulphuric acid required for the second part of the test.

We can think of no more interesting field of research than that offered by a continuation of these studies with regard to the appearance of carbohydrates in the urine and the exact nature of the

disturbances of the normal metabolic processes of which the carbohydraturia is the expression.

It is through the careful study of the causes of the transitory and comparatively insignificant saccharine conditions of the urine that we may perhaps hope for the ultimate solution of the absorbing problem—the pathology and pathogenesis of diabetes mellitus.

#### MERCANTILE MEDICINE.

IN reference to the character of the advertisements admitted to the advertising pages of a medical journal there must necessarily obtain a certain measure of latitude of individual opinion. There are all grades and degrades of admissibility and of non-admissibility. Every publisher, with whom the responsibility of course rests, must decide the matter for himself. Just as a lay journal must reject the worst, unless itself be the worst sort of journal, so must a medical journal, unless of the worst sort, reject the most disreputable medical advertisements. The ideal standard of editorial supervision of advertisements cannot be even inaugurated so long as the medical profession is content to allow its journals to be published by private and non-professional enterprise. Unless controlled and supported by the profession, the profession may not dictate to the publisher what he may admit to or reject from the advertising pages. It may condemn, but not dictate.

It is, of course, different with the reading columns. These are—or, alas! that we must add, these *should* be—under the control of a physician, and the profession has a right to demand that no one of its members, acting as editor, shall allow a line in the reading columns of his journal to be tainted with bribe or digrace.

The rule that a self-respecting, or even a shrewd publisher will follow will be to admit nothing to the advertising pages that is opposed to the true interests and progress of medicine, and that in the eyes of the majority of the better class of physicians is frankly unprofessional.

All this is equivalent to saying that the responsibility rests at last with medical men. If they will, they can control both the editor that prostitutes his reading columns and the publisher that sells his advertising pages to whomsoever will buy.

One further distinction should be made: Of a medical journal published by non-professional enterprise, there may not be demanded that high

standard of exclusion of semi-disreputable advertisements that is rigorously called for in a medical journal edited by a corps of brilliant professional leaders, presumably and ostensibly in the sole interest of medicine, and published by, with the sanction, or under the control of a great medical and educational institution.

And now we wish to ask the PROVOST AND THE OFFICERS OF THE UNIVERSITY OF PENNSYLVANIA, the publishers of the *Annals of Surgery*, and MESSRS. PILCHER, TREVES, WHITE, and MACEWEN, editors of the *Annals*, if each and severally they consider the admission of a sixteen-page advertisement appearing in their November issue a proper and a professional thing to do. From Western daily lay newspapers we have during the past year heard much of this same "cure"; it is a secret proprietary preparation, and it claims for itself that it is an "absolute cure" for diseases that kill and afflict something like one-half of the human race. Is this proper stuff to appear in the advertising columns of any but such "medical journals" as are plainly in the auction market to sell themselves for anybody's money?

Warning its readers, the *St. Louis Medical and Surgical Journal*, with an apparent over-modesty and caution, says of the bribe offered to itself (and a splendid one it was, of course, financially) that "it does not need money as badly as that, yet," but that the *Maryland Medical Journal* and the *Medical Brief* did consent to sell "their manhood and respectability (*sic*!) for the mess of pottage." We are in the same boat, good neighbor, and we are moreover glad to know that we row with the same *sculls*!

And neither the affidavits, with the addresses of the three hundred "physicians" appended to the advertisement, nor those of the "ten thousand" others claimed, alter, but rather most strikingly confirm our conviction that the whole affair is another sad evidence of the seriousness and virulence of the parasitic disease afflicting the American medical profession.

#### MEDICAL BOARDS AND TRUSTEES OF HOSPITALS.

ALTHOUGH the advice *ne sutor ultra crepidam* has been handed down through the ages, a very large majority of men that are in most things as intelligent as the average consider that in many medical matters what they are pleased to term their

"common sense" and "business judgment" are on a par with the experience and education of the physician, who for some mysterious reason is assumed to be devoid of, or lacking in, those mental qualifications that are the endowment of the successful tradesman. That such an impression exists is not altogether the fault of laymen, for it has been a matter of experience that physicians themselves are largely to blame for the patronizing attitude that is often displayed toward them.

Some time ago, in one of the New York hospitals, there was a conflict of authority between the medical board and the trustees, so the press informed us, to determine whether the medical board was "to govern the institution altogether, or whether the gentlemen who contribute to its maintenance were to have something to say." The friction seems to have arisen because the medical board filled a vacancy in the house-staff without consulting the trustees, and because the board failed to discipline a member of the house-staff as the trustees, in their presumably superior wisdom, deemed meet and proper. In this particular institution the charter gave the medical board absolute control over the medical affairs of the hospital, while the trustees desired to usurp this control *vi et armis* on the ostensibly highly ethical principle that "if a member of the hospital staff misbehaved himself, that particular hospital was not the place where he could remain." In this hospital, as in most similar institutions in large cities, the members of the medical board were among the foremost physicians; most competent to judge of the qualifications of a candidate for the house-staff, and well qualified to administer efficient discipline to a delinquent, so that the imputation of the trustees was but a gratuitous insult.

On the one hand, we have a number of physicians whose names, as officers of the institution, give it prestige; while, on the other hand, we have some eminently respectable persons whose chief claim to prominence is a rating in *Dun's* or *Bradstreet's*, and whose only opportunity to let their "light so shine before men" that their good deeds may be seen is to get these medical gentlemen to act as their almoners. If the latter refuse to comply with the evident desire of these humanitarians to couple servant with almoner, where would be either these philanthropists or the institutions that they support? The successful administration of the army, navy, marine, and many civil and

private hospitals throughout the country that are under the complete management of physicians, demonstrates beyond peradventure that boards of trustees are supererogatory, while we are not aware that experience has yet shown that physicians can be dispensed with.

The fact that, in this particular case, it has been paraded that if the medical board resigned the trustees could easily fill their places, is unfortunately and lamentably true. Past experience has shown that when the action of trustees of eleemosynary institutions has forced the members of the medical staff to resign, the places of the latter were almost at once filled by other physicians, who sold the birthright of their professional independence for a mess of place-holding pottage.

While awaiting that millennium in which physicians will refuse to accept vacancies so created, and thus stultify the dignity of their calling by yielding up, *ad illiteratas*, authority over matters that properly belong to themselves, we can only urge that medical men will seriously consider the advisability of not connecting themselves with new institutions in which the charter does not expressly vest them with authority over the medical affairs. Render unto the trustees the things that are the trustees', and unto the medical staff the things that are the medical staff's; as a committee on ways and means the trustees will have abundant occupation, and the judgment of the medical staff will safely administer the *res medica* of the institution.

## SELECTIONS.

### THE DUTY OF MEDICAL JOURNALS.

THE prescribing of substances of which the prescriber is totally ignorant as to their exact composition should be condemned absolutely by all those who have medical science and the good of mankind at heart.

Only those things that are fully understood, so far as our clinical and physiological knowledge has made clear, can be considered as safe and scientific to administer.

Every medical journal should demand, in each instance, more exact and positive statements than are now obtained regarding the nature of many substances, even within the sanction of the Pharmacopeia.

When this is done, the manufacturing chemists will make still greater exertions than hitherto to satisfy this demand for positive knowledge; but so long as the profession will accept vague and verbose statements as declarations of scientific facts, there is but little motive to force deeper investigation.

When this demand for definite information becomes

a common practice, our knowledge will become more exact, and therapeutics more certain. There will be less inclination to use those much-vaunted compounds of unknown composition that are so often guaranteed to "cure the incurable."

At the same time every medical journal should condemn with equal vigor, both in its reading-columns and its advertising-space, everything which tends to make medicine more blind and uncertain. Only those things should be admitted that intelligibly explain themselves.

When this practice becomes somewhat of a universal rule, empiricism will of necessity give place to a true and exact state in medical science. Quackery will steadily and irresistibly be forced into the background. But, so long as there is a semblance of recognition maintained between scientific medicine and quackery, the complete destruction of the latter cannot be accomplished.

If once the now-apparent bond of union between them is *completely divided*, the two, by their inherent nature, will repel each other. They will progressively diverge until recognition between the two is no longer among the possibilities.

If the medical profession is ready and willing—as it ought to be—to stand by the resolutions recently adopted by a number of medical societies and by the declarations here announced, a much more scientific condition in the practice of medicine can easily be instituted.

Only one thing more remains to secure complete success in this consummate undertaking, which is that all *our contemporaries* come forward and fully support the same principles and high standard.

With the medical profession and the medical journals united in one solid phalanx against proprietary medicines and nostrums of unknown composition, the defeat of quackery must be the final and speedy result.

It is hard to comprehend how any medical man who respects the oath which he took with the granting of his diploma can dare to give to his patients compounds or nostrums the composition of which is absolutely unknown to him. What does he give them for, and what results can he possibly expect by giving a something, he knows not what? How can he tell whether the result has been good or bad? How can he tell that he is not damaging irreparably the constitution of his patient?

Morally he has no right to take such risks, even if he can be protected by civil law.

The editor who sanctions the presentation of such matters in the journal through which he acts as the guide of medical thought should, for his own sake, stop and ask himself whether his blindness toward quackery, either in the editorial, reading, or advertising columns, will be much longer tolerated by the medical profession!

—*Merck's Bulletin*.

### REFORM.

UNDER this head, while commenting on the prize offered by Dr. George M. Gould, the *Medical Visitor* (homeopathic) says:

"It would be very easy for a homeopath to win that prize if the homeopathic school is to be taken as a unit. When an impartial observer looks about him it is not surprising that such an offer as the foregoing should be made. In one college the professor of dermatology



uses the same local applications that are recommended by Fox and others, and the homeopathic treatment is a secondary affair. In another the professor of practice tells his students that intermittent fever cannot be cured without quinine in from ten to fifteen-grain doses. In a third, the class is told that erysipelas cannot be cured with homeopathic remedies. In a fourth, the teaching is so foreign to the laws of homeopathy that many of the graduates have gone, bag and baggage, over to the allopathic school. In the fifth, one of the professors of theory and practice cordially indorses a man who does not even claim to be a physician, as skilled in the treatment of skin-diseases, and his name is attached to the quack's circulars which are widely circulated throughout the city. In a sixth—but why multiply examples of the degeneracy of the homeopathic colleges with the ridiculous pretensions of the majority of the professors, homeopathic in name only and eclectic, or worse, in teaching. Both east and west, good men, true homeopaths, have resigned from the colleges because reform in these institutions was impossible. Remonstrances were of no avail and the mongrels held the balance of power.

"The rank and file cast aside, temporarily at least, the homeopathic law for the gold cure, for Christian science, for Kochism, and for every new medicine and new fad that shows its head. Hahnemann was too much of an old fogey for them and they want a reformed homeopathy."—*The Toledo Medical Compend*, August, 1892.

## REVIEWS.

AN AMERICAN TEXT-BOOK OF SURGERY, FOR PRACTITIONERS AND STUDENTS. By Charles H. Burnett, M.D., Phineas S. Conner, M.D., Frederic S. Dennis, M.D., William W. Keen, M.D., Charles B. Nancrede, M.D., Roswell Park, M.D., Lewis S. Pilcher, M.D., Nicholas Senn, M.D., Francis J. Shepherd, M.D., Lewis A. Stimson, M.D., William Thomson, M.D., J. Collins Warren, M.D., and J. William White, M.D. Edited by WILLIAM W. KEEN, M.D., LL.D., and J. WILLIAM WHITE, M.D., Ph.D. Profusely illustrated. Philadelphia: W. B. Saunders, 1892.

THIS handsome volume comes before the profession with very considerable prestige. The gentlemen concerned in its preparation are well known in the surgical world, both as teachers and as writers, and their names may be taken as a guarantee that the doctrines and practice set forth in it will be in accordance with the best modern lights. Its editors represent two of the largest and most reputable medical colleges on this Continent. Its title is an attractive one, suggesting the idea of a work which shall embody the best fruits of American effort for the advancement of the science and art of surgery, give full recognition to the achievements of our countrymen in this field, and base its teachings upon the records of their researches and experience. Such an impression is further conveyed by the dedication "to the medical profession and medical students of America, by their co-workers and fellow-students, the authors."

On examination, however, we do not find this fair promise fulfilled. Outside of their own charmed circle,

the authors seem to have found scarcely anything worthy of mention that their co-workers in this country have done. German, French, and English authorities are quoted in abundance, but only here and there does an American name appear. Yet we cannot but think that there have been made in the United States contributions to the science and art of surgery that should not have been overlooked, but should by all means have been brought forward with full credit in a work that distinctively claims to be American. Those who have studied surgical literature for the last thirty or forty years must have watched with pride the steady growth in amount, and especially in value, of the material furnished by our countrymen, not only in the Eastern States, but in the West and in the South. It is more and more appreciated and quoted abroad; it ought not to be ignored at home.

As already said, the soundness of the teachings contained in this work needs no stronger guarantee than is afforded by the names of its authors. In the preface it is stated that

"The entire book has been submitted in proof-sheets to all of the authors for mutual criticism and revision. As a whole, the book may therefore be said to express upon important surgical topics the consensus of opinion of the surgeons who have joined in its preparation, although it must be understood that, while it thus represents in general the views of all the authors, each individual author is free from absolute responsibility for any particular statement."

This seems to us like affixing the word "limited" to the name of a business firm. We think it would have been better had each author signed the articles contributed by him.

As might be expected, the style in the various portions of this work varies considerably; but it is in general such as to make very hard reading. The authors seem to have aimed too much at encyclopedic completeness for the limits even of their 1175 pages. On many subjects there is an abundance of detail in excess of the needs of the student, while others are passed in review all too briefly. Luxations of the hip are disposed of in five pages, while carcinoma of the uterus occupies eight, and fibro-myomata of the uterus nearly nine. Nearly two pages are given to the discussion of "paratoloid," or Koch's remedy, and more than a whole page to rupture of the thoracic duct; either of these subjects might have been dismissed, in a text-book, with six lines.

The preparation of a work thoroughly suited to the practical purposes of a text-book is a much more difficult task than the writing of a treatise for advanced readers. Students need clear statements of the broad principles of the science, in a readable form; they are bewildered by references to conflicting views and opinions, unless they are distinctly told what to accept and what to reject. Of course there are matters under controversy, unsettled questions, which must be mentioned as such; but these are exceptional. The more distinctly the existing aspect of the science is focussed, as it were, for the untrained eye of the student, the better is the object attained. Statistics and percentages are superfluous, and should be wholly avoided.

The illustrations of the work before us are very abundant, in various styles, and of varying degrees of merit.

Some of the original plates are exceedingly good, notably Plates VIII and XIII. On the other hand, most of the original woodcuts are singularly bad, not only from an artistic point of view, but as not conveying any idea of the thing intended.

**MEDICAL MICROSCOPY. A GUIDE TO THE USE OF THE MICROSCOPE IN MEDICAL PRACTICE.** By FRANK J. WETHERED, M.D. Lond. Philadelphia: P. Blakiston, Son & Co., 1892.

It is an encouraging feature in the progress of medicine to note that greater and more exhaustive efforts are being made to reduce it to an exact science. The microscope, more than any other one agent, perhaps, has come to be recognized as the most efficient ally in this direction. It is with pleasure, then, that the progressive practitioner should welcome a work under the foregoing title. It is a busy man's book, one that aims to cover a wide and varied field, not exhaustively but concisely, dispensing with minutiae while retaining the salient points.

For the benefit of those who may wish to study details inconsistent with the purpose of the book, there is, in addition to occasional references throughout the text, an excellent bibliography.

Of the twenty-four chapters, twelve are devoted to histologic technique, including a thorough fundamental description of the microscope. This deserves all the space allotted to it. Clearness, accuracy, and completeness are imperative. The use of the term "object-glass," though not rare, is likely to cause misapprehension, as a strict interpretation might lead one to think that the glass slide upon which the object is mounted, or even the cover-glass, is referred to. The confusion is not lessened by the occasional use of the more preferable term—objective. Due stress is placed upon cleanliness, but great danger lurks in the chamois, on account of the oil in it, and because it holds very readily small particles of dirt, and the slightest scratch upon the lens of a good objective impairs or totally destroys its usefulness. Japanese filter or lens paper is to be preferred. In cutting celloidin sections a firm and unyielding substance like wood is preferable to cork, because the surface of the latter is likely to be made convex by the jaws of the microtome, and distorted sections are the result.

A few errors, typographic perhaps, appear. On page 321,  $\frac{1}{1000}$  inch should be  $\frac{1}{10000}$  inch, to become the equivalent of  $2\mu$ . On page 50 Merbrél's solution should be Merkel's. On page 53 *et seq.* Perenzi should read Perenyi. On page 133 *et seq.* Golgi has become Jolgi. It is not apparent why the author should describe Golgi's "sublimate method" and ignore entirely his more widely known and—as modified by Ramon y Cajal—more expeditious "silver nitrate method." Two references are made to figures in the frontispiece, but no frontispiece appears.

The desirability of using vernacular terms in books to be published outside of one's own country is rather questionable. A case in point is the use of the word "swill," meaning to rinse. The term, besides being inelegant, has the further objection of being obsolete in this connection. Similarly we note the word "embryonal," which is not only unusual but etymologically incorrect.

A commendable feature is the writing of the various formulæ in "parts," thus adapting them to either the metric or the apothecaries' system. The metric system in this work exemplifies a gradual evolution from a complete absence at the beginning to an almost exclusive use at the end.

The chapters on Tumors, Urinary Deposits, Feces, Sputum, Vomit, Discharges and Contents of Cavities, and the Discharges from the Genital Organs, are chiefly concerned with pathology. Clear and concise directions are given as to manipulation, and much important information as to the diagnostic value of the results. The chapter on the Examination of the Blood, besides dealing with its pathology, gives good directions for counting the corpuscles and for estimating the amount of hemoglobin. A short chapter is also devoted to Cutaneous Parasites. It is to be regretted that more was not said concerning the examination of food and water; for, as the mouth is the door through which many diseases enter the system, anything pertaining to preventive medicine needs as much, or more, emphasis than matters pertaining to diagnostic or curative medicine. The final chapter deals exclusively with Bacteriological Methods. Good illustrations in this and preceding chapters are a valuable aid to the reader. The methods are recent and compactly stated. If other departments could be reduced to as accurate a basis, medicine would indeed be "essentially an exact science."

**A MANUAL OF MEDICAL JURISPRUDENCE.** By ALFRED SWAIN TAYLOR, M.D., F.R.S. Revised and Edited by THOMAS STEVENSON, M.D. Lond. Eleventh American, edited, with Citations and Additions, from the Twelfth English Edition, by CLARK BELL, Esq., President of the American International Medico-Legal Congress of 1893. Pp. 787, with 56 illustrations. Philadelphia: Lea Brothers & Co., 1892.

At the present day, when so many books are published without any observable reason for their existence, unless it be to gratify the vanity of their authors, it is a relief to find a book whose first and most prominent fault is that too much of valuable truth is crowded into an insufficient number of pages.

We are prone to find fault with the author and compliment the publisher, but in looking over the vast amount of material offered to the reader in Taylor's *Jurisprudence* we are forced to deplore the crowded state of its instructive chapters. The material is worthy of two volumes of much larger and clearer type. We also regret the absence of suitable illustrations. If one will take the time and trouble to visit medical publishers, in search of literature on medical jurisprudence, it will be seen at once how very little we have at hand at present and how urgently this work has been needed.

While books have been published in every other department of medical science until the work has been surely overdone, medical jurisprudence has been actually neglected. Taylor's *Jurisprudence*, always a standard work of genuine value, has been greatly improved by the faithful work of Clark Bell, whose wide learning and great experience as an editor of the *Medico-Legal Journal* have admirably fitted him for the task he has so skilfully and satisfactorily completed, so far as this edition is concerned.

With the plan so far developed it will be an easy task to add one or two hundred pages more with suitable illustrations, and then present a book which will stand absolutely without a rival in the literature of legal medicine. We can confidently recommend this book to the medical practitioner of to-day as *the best obtainable*. To quote from the preface of the eleventh American edition, much new matter has been added, many portions of the work have been amended, and some parts have been rewritten. Nearly seven hundred cases and authorities have been cited.

The work is perhaps more complete from the jurist's standpoint, and if it lacks in value, it is in matters purely professional.

The article on "Suicidal and Homicidal Gunshot Wounds" is particularly disappointing in view of the many remarkable cases which have attracted attention during the past ten years.

The great fault which most of our medical books have, to the everlasting annoyance of medical readers, is the *index*—this is not as carefully prepared as it should have been, but it is in point of fact better than the average.

Clark Bell has given the medical profession a book on legal medicine which will be a safe guide and counselor, useful alike for the student and the busy practitioner.

When we consider that a physician's reputation may be made or marred by his management of his first medico-legal case, such a treatise as this is one which has been urgently needed, and will undoubtedly be heartily appreciated by the medical and the legal professions.

## SOCIETY PROCEEDINGS.

### NEW YORK ACADEMY OF MEDICINE.

*Stated Meeting, Thursday Evening, October 20, 1892.*

DR. J. O'DWYER read a paper on "Intubation *versus* Tracheotomy for Acute Laryngeal Stenosis in Children." He stated that by acute laryngeal stenosis he meant fibrinous diphtheria or membranous croup, which is the most fatal of all diseases of early life. He referred to the statistics on this subject given by Dr. R. W. Lovett, of the Boston City Hospital, in which the percentage of recoveries following tracheotomy was larger than that following intubation. These statistics, he said, cannot be considered as a safe guide, as the operations were done by the hospital-staff, who did not remain on duty long enough to obtain the skill necessary to perform intubation successfully. In twenty-one of the cases cited, intubation was attempted, and immediate tracheotomy necessitated by the cessation of breathing. Three times death occurred during the attempts made to introduce the tubes. In two cases the tubes were drawn into the bronchi. In two cases the insertion of the tube was followed by convulsions. In two cases the instrument broke during the operation. This record, Dr. O'Dwyer says, shows too many failures to have followed an operation that should have no failures.

One of the chief objections urged against intubation is that it is difficult to feed a patient while the tube is in the larynx. This usually happens, the speaker said, when the throat has been lacerated by long-continued efforts

to introduce the tube. It is a difficulty in some cases, but serious results are not caused by it. The operation of intubation is a difficult one, because it must be done very rapidly. A period of ten seconds is not safe in some cases, and fifteen seconds would certainly produce apnea in many instances. The necessary touch and skill require much practice, and this should be acquired on the cadaver until the tube can be inserted in different subjects in about five seconds. It is much easier to perform intubation in some subjects than it is in others. After such prolonged practice, the operation may be done with comparative safety.

No great amount of surgical skill is required to perform tracheotomy, but good nursing is a necessity. Intubation, therefore, calls for a trained operator, and tracheotomy for a trained nurse. In the Boston City Hospital the recoveries following intubation amounted to 20 per cent. In the Willard Parker Hospital, in New York, the percentage of recoveries amounted to 38 per cent.; in Buda-Pesth to 39 per cent. At the Boston City Hospital tracheotomy has saved one patient in fourteen. Dr. O'Dwyer, by intubation, has saved one in six. Secondary tracheotomy succeeds when there is loose membrane in the lower part of the trachea, which cannot be got rid of by intubation. Intubation practically accomplishes all that tracheotomy can accomplish, without possessing any of its unpleasant features.

DR. L. S. PILCHER, of Brooklyn, said that in the vast number of cases, acute laryngeal stenosis in children is due to the accumulation in the larynx of a diphtheritic exudate. For over thirty years diphtheria has prevailed endemically in New York and Brooklyn, and it is to-day one of the chief causes of death in these cities. The tubes of Dr. O'Dwyer are not well adapted for the removal of the diphtheritic exudate in the trachea. Such masses may at any moment cause a crisis, and immediate death may follow the introduction of the tube. It is too late then for tracheotomy, and the fatal result can rarely be averted. Secondary tracheotomy shows a very small percentage of recoveries, however skilfully the operation is done. In order to relieve acute laryngeal stenosis, therefore, most surgeons still believe in opening the trachea from without, at some distance from the thyroid gland. One of the points of success is to rapidly remove the detritus which wells up. Deglutition is not interfered with by the presence of a canula in the trachea introduced through an external incision. Intubation would be resorted to in less dangerous cases than would tracheotomy, and this fact is likely to affect the statistics, so that no reliable conclusions can be drawn from them as to the comparative merits of the different procedures. When a diphtheritic exudate has formed, intubation answers the indications for surgical interference much less than tracheotomy, and the former should not, as a rule, be used as a substitute for the latter. Nevertheless, intubation has supplanted tracheotomy to a very considerable extent, especially in this country. During the past seventeen years, Dr. Pilcher said, he has been called upon 66 times to perform tracheotomy, while a physician in his neighborhood has, in the past four years, been called upon 142 times to perform intubation.

DR. GEORGE S. GAY, of Boston, stated that up to July 1, 1892, tracheotomy for croup was performed 514 times at the Boston City Hospital. In 116 of these cases



recovery followed. Intubation was performed 502 times, with 91 recoveries. In 58 instances both operations were performed on the same patient, with only 7 recoveries. These statistics show a difference of four per cent. in favor of the older operation. The degree of relief obtained from the dyspnea, rather than the final result, is the standard by which the two operations should be judged. Does tracheotomy relieve dyspnea when intubation fails? In some cases, in which membrane is pushed down by the introduction of the tube, tracheotomy will afford relief, but such cases are very uncommon. If the obstruction is situated very deeply, then neither operation will give relief.

Dr. Gay said that intubation is by no means perfect, but it possesses sufficient advantages to give it a permanent place in the treatment of acute laryngeal stenosis. Although it will never entirely displace tracheotomy, the former has some important advantages over the latter. No anesthetic is required; there is no hemorrhage. Unless one's early experience with intubation has been particularly favorable, he is likely to prefer tracheotomy. The strongest advocates of intubation will be found among those who have had the largest experience with it. The consent of the parents to perform intubation is more easily obtained, and the operation can be resorted to earlier.

A letter was read from DR. F. E. WAXHAM, of Chicago, who gave the following statistics as the result of his personal experience with intubation in acute laryngeal stenosis, all occurring in private practice: Under one year of age, 12 cases, with 4 recoveries; 33 per cent. At one year of age, 58 cases, 13 recoveries; 22 per cent. At two years, 74 cases, 30 recoveries; 40 per cent. At five years, 40 cases, 18 recoveries; 45 per cent. At six years, 26 cases, 7 recoveries; 26 per cent. At eight years, 10 cases, with 6 recoveries; 60 per cent. In all, he reported 421 cases, with 146 recoveries; 34.67 per cent.

DR. ABRAHAM JACOBI said that when this subject had been discussed at the Academy, four or five years ago, he was converted from tracheotomy to intubation. Before that time he had performed many tracheotomies—probably between six and seven hundred. It is very easy to get the parents' consent to perform intubation, but it is very difficult to get their consent to perform tracheotomy. For this reason in many cases the latter operation is performed too late. It is true that modern surgery has done away with a number of the dangers to be contended with in performing tracheotomy in 1860 and 1870, and even later, but it is still almost impossible to keep the wound in the trachea aseptic, and the baby often dies from two kinds of sepsis, so to speak: the sepsis of diphtheria and secondary sepsis. Dr. Jacobi said that, although he is in favor of intubation, and always recommends it, he has never performed the operation personally. Thirty years ago he was a professed tracheotomist, and on one occasion he was told that he was a good enough man, but that he cut too many throats.

DR. FRANCIS HUBER stated that while both intubation and tracheotomy possess certain intrinsic advantages, he favors intubation as a primary measure in laryngeal diphtheria. The mortality varies in different years and in different epidemics. He recommends the use of mer-

curic chloride in cases of early diphtheria. In children under two and a half years of age, intubation certainly gives better results than tracheotomy.

DR. A. L. LOOMIS inquired of Dr. O'Dwyer whether he ever meets with a case in which he finds it impossible to insert the tube.

DR. O'DWYER replied that he never meets with such cases now. Such an event did occur during his early experience, and with the imperfect instruments then employed.

## CORRESPONDENCE.

### THE METRIC AND APOTHECARIES' SYSTEMS COMPARED.

*To the Editor of THE MEDICAL NEWS,*

SIR: Dr. Forrest (THE MEDICAL NEWS, October 22, 1892) states that "... it [the metric system] is highly objectionable, both from a scientific and practical point of view." He holds that: "... the standards of our forefathers should be more proportionate and fitting than a late and arbitrary invention."

I shall attempt to answer some of his arguments.

First, from a scientific standpoint, let it be granted that the metric system is not as perfect as it might be for the reasons he gives. Is the apothecaries' system more so? What is the grain if not an arbitrary standard, and one, moreover, that bears no definite simple relation to units of volume and length? And which is the more scientific, a system that divides decimally throughout, or one that divides a gallon into eight parts, each of those into sixteen parts, each of those into eight parts again, and finally each dram into sixty parts, thus using three systems of division in the one system of measures, and also varying its measures in the two countries in which it is most used. In addition to this the confusion of terms whereby an "ounce" may signify either 480 or 437½ grains is surely unscientific.

So much for the scientific side of the question, which is, perhaps, of less importance than the practical side.

As to the convenient division of the dose, wherein is it more convenient to divide a dose into halves, quarters, etc., than into fifths, tenths, and hundredths? Surely Dr. Forrest will not advocate guesswork where the halves and quarters are so convenient, and it is as easy to measure 25 c.c. as one-fourth of an ounce.

What advantage has the grain, which is divided into all sorts of fractions, to express the doses of the powerful alkaloids, over the milligram, which is decimally divided?

As to the inconvenience in size of the meter and centimeter, we have comparatively little to do with them, as the units of weight and volume concern us more often, and we hear no complaint of inconvenience in size from the chemical laboratories that use the metric system almost exclusively.

And what relation do any of these weights and measures bear to the "size and strength of the average man or the materials to be weighed or measured?"

As to the international character of the metric system, a prescription written in that system would be correctly filled at almost any drug-store in the United States, Germany, France, Italy, and probably England. Can as

much be said of a prescription using the apothecaries' system, which would not be the same if compounded even in England as here?

And as to "all the people who use the metric system at home," coming to this country and England to buy, how do our exports of drugs compare with our imports from Germany and France alone?

Finally, Dr. Forrest says the metric system is "an intolerant system, an ally of despotism."

I do not suppose any one wishes to compel Dr. Forrest to use the metric system in his individual prescriptions any more than we are now compelled to use the apothecaries' system.

The Committee of Revision of the Pharmacopeia adopted the metric system, and it is, therefore, as much an American system as our linear measure, which came originally from England.

Because a good thing originates abroad, it is not necessarily patriotism to refuse to adopt it at home.

And why would it not be a good thing to have another "international standard" conference in connection with the proposed international monetary conference?

Very respectfully,

A. P. SUMMERS, PH.D. (Yale), M.D.

FOSTER'S FALLS, VA.

#### A PLEA FOR CLEARER PHRASEOLOGY IN ABDOMINAL SURGERY.

To the Editor of THE MEDICAL NEWS,

SIR: The editorial in THE MEDICAL NEWS for October 15, 1892, entitled "Celiotomy versus Laparotomy," calls attention to a fact of great interest to the educated physician, as the technical language of medicine is too often cloudy, cumbersome, and, at times, well-nigh meaningless.

The term "laparotomy" has long been a thorn in the flesh of many, and your determined stand against it is commendable.

The word "celiotomy," however, while etymologically the correct one to employ when it is intended to convey the idea hitherto expressed by "laparotomy," ought not itself to be used, except, perhaps, in a very few instances.

"Celiotomy" expresses merely the surgical penetration of the abdominal cavity. It does not state for what purpose the cavity is opened.

Is it not better, then, to drop all obscure terms and to state, simply and precisely, the exact word or words necessary to express the entire idea? Such accurately descriptive words are, e.g., "oöphorectomy," "gastro-enterostomy," "hepatotomy," "abdominal hysterectomy," "section for tuberculous peritonitis," etc.

"Celiotomy" need be employed very seldom, if at all. On the other hand, "laparotomy" has a legitimate use; the expression "laparotomy for appendicitis" being proper, though rather unprecise, when the section has been made in the groin.

Trusting that this little plea for more exact, and hence more scientific terminology in medicine may bear with it some slight influence in the right direction, I am,

Most sincerely yours,

SCHUYLER C. GRAVES, M.D.

GRAND RAPIDS, MICHIGAN.

#### NEWS ITEMS.

*Program of the Fifth Annual Meeting of the Southern Surgical and Gynecological Association*, to be held in the Council Chamber, City Hall, Louisville, Ky., on November 15, 16, and 17, 1892.

Address of Welcome and Response.

"The Simple, Septic, Traumatic, and Specific Forms of Cervicitis and their Treatment." By Bedford Brown, M.D., Alexandria, Va.

"Experiences in Pelvic Surgery." By A. V. L. Brokaw, M.D., St. Louis, Mo.

"Craniotomy upon the Living Fetus is Not Justifiable." By Cornelius Kollock, Cheraw, S. C.

"A Case of Extensive Hematocele Resulting from Tubal Pregnancy Rupturing into Broad Ligament." By W. D. Haggard, M.D., Nashville.

"Contribution to the Study of Abdominal Pregnancy." By H. C. Coe, M.D., New York City.

"Tubal Pregnancy." By Joseph Price, M.D., Philadelphia, Pa.

"Fibroid Tumor of Uterus; Pregnancy; Rupture at Fourth Month; Operation Six Weeks Afterward; Death." By S. M. Hogan, M.D., Union Springs, Ala.

"Some Kidney Operations, with Remarks." By Geo. Ben. Johnston, M.D., Richmond, Va.

"Surgery of the Ureter." By Chas. A. L. Reed, M.D., Cincinnati, O.

"Surgical Treatment of Inguinal Hernia in the Male." By Henry O. Marcy, M.D., Boston, Mass.

"A New Operation for the Radical Cure of Inguinal Hernia." By G. A. Baxter, M.D., Chattanooga, Tenn.

"Treatment of Umbilical and Ventral Hernia." By W. H. Wathen, M.D., Louisville, Ky.

"Symptoms of Fractures; Their Importance and Significance." By W. C. Dugan, M.D., Louisville, Ky.

"Treatment of Ununited Fractures." By W. O. Roberts, M.D., Louisville, Ky.

"Poisoning by the Bite of the Southern Spider." By J. T. Wilson, M.D., Sherman, Texas.

"Intestinal Anastomosis by a New Device." By H. Horace Grant, M.D., Louisville, Ky.

"Intestinal Anastomosis without Mechanical Devices and Circulo-lateral Enterorrhaphy." By John D. S. Davis, M.D., Birmingham, Ala.

"Stone in the Bladder, with Report of Cases." By Floyd W. McRae, M.D., Atlanta, Ga.

"Ovarian Cystoma with Twisted Pedicle and Peritonitis; Ovariectomy in Second Week of Typhoid Fever; Recovery." By L. S. McMurtry, M.D., Louisville, Ky.

"Morphology of Abdominal Tumors." By Howard A. Kelley, M.D., Baltimore, Md.

"Surgico-electrical Treatment of Epilepsy." By B. E. Hadra, M.D., Galveston, Texas.

"A Plea for More Rapid Surgical Work." By Ap Morgan Vance, M.D., Louisville, Ky.

The President's Annual Address. By J. McFadden Gaston, M.D., Atlanta, Ga.

"Specialism as Related to the Practice of Gynecology." By Wm. Warren Potter, M.D., Buffalo, N. Y.

"The Relation of the General Practitioner to Gynecology." By R. M. Cunningham, M.D., Birmingham, Ala.

"Specialism in Medicine." By W. F. Westmoreland, M.D., Atlanta, Ga.

"Personal Recollections of the late Dr. Benjamin W. Dudley, of Lexington, Ky., and his Surgical Work." By Bedford Brown, M.D., Alexandria, Va.

"Appendicitis." By Edward McGuire, M.D., Richmond, Va.

"The Surgical Treatment of Tubercular Peritonitis." By Wm. H. Meyers, M.D., Fort Wayne, Ind.

"The Present Status of Drainage in Surgery." By A. Morgan Cartledge, M.D., Louisville, Ky.

"Modern Bacteriological Research in Relation to the Surgery of the Genito-urinary Organs." By G. Frank Lydston, M.D., Chicago, Ill.

"Nature of Shock and Allied Conditions." By Wm. C. Dabney, M.D., University of Virginia.

"Shock." By Jas. Evans, M.D., Florence, S. C.

"Ovariectomy on Old Women." By Joseph Taber Johnson, M.D., Washington, D. C.

"A Manipulative Mistake and its Consequence." By Geo. Ross, M.D., Richmond, Va.

"Operation for Hare-lip without the use of the Pin." By Wm. Perrin Nicholson, M.D., Atlanta, Ga.

"The Part that Rectal Diseases Play in Women." By J. W. Mathews, M.D., Louisville, Ky.

"Cholecystotomy, with the Report of a Case." By Edwin Ricketts, M.D., Cincinnati, O.

"Treatment of Stones in the Biliary Ducts." By W. E. B. Davis, M.D., Birmingham, Ala.

"Puerperal Peritonitis." By Richard Douglas, M.D., Nashville, Tenn.

"Large Uterine Myoma; Abdominal Hysterectomy; Recovery (with Specimens)." By L. S. McMurtry, M.D., Louisville, Ky.

"Cysts of the Mesentery." By Jas. A. Goggans, M.D., Alexander City, Ala.

"Case of Obscure Abdominal Hemorrhage." By I. S. Stone, M.D., Washington, D. C.

*Dr. J. Collins Warren* has accepted the Executive Presidency of the Section on Medical Pedagogics of the Pan-American Medical Congress.

**Alvarenga Prize of the College of Physicians of Philadelphia.**—The College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about one hundred and eighty dollars, will be made on July 14, 1893, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

Essays intended for competition may be upon any subject in Medicine, but cannot have been published, and must be received by the Secretary of the College on or before May 1, 1893.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within it the name and address of the author.

It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award.

The Alvarenga Prize for 1892 has been awarded to

*Dr. R. H. L. Bibb*, of Saltillo, Mexico, for his essay entitled "Observations on the Nature of Leprosy."

*Lukasiewicz*, the first assistant at the clinic of Kaposi at Vienna, has been made extraordinary professor of Dermatology and Syphilology at the University of Innsbruck.

*Dr. L. S. McMurtry*, of Louisville, has been elected professor of Gynecology in the Hospital College of Medicine, Medical Department of the Central University of Kentucky.

*Wassiliew* has been made Professor of Clinical Medicine at Dorpat.

#### BOOKS AND PAMPHLETS RECEIVED.

Prospectus of the St. Louis College of Pharmacy, Twenty-seventh Annual Session. St. Louis: Gast Print.

Colpo-perineorrhaphy. By Edward W. Jenks, M.D. Reprint, 1892.

The Operative Treatment of Enlargement of the Prostate. By C. W. Mansell Moullin. A Pamphlet. London: John Bale & Sons, 1892.

The Sensory-motor Functions of the Brain. By L. Harrison Mettler, A.M., M.D. Reprint, 1892.

Some Remarks on Pneumonia and the Cause of Heart-failure, with Report of a Case. By L. Harrison Mettler, A.M., M.D. Reprint, 1892.

Early Symptoms and Etiology of Hip-disease; Treatment of Abscess in Hip-disease. By H. Augustus Wilson, M.D. Reprint, 1892.

Concerning the Employment of Light in the Treatment of Disease. By Will F. Arnold, M.D. Nashville, Tenn.: Brandon Printing Company, 1892.

Excision of Tubercular Knee-joint; a Case of Incipient Hip-joint Disease. By H. Augustus Wilson, M.D. Reprint, 1892.

Some Prevalent Errors Relating to "Eye-strain" as a Cause of Nervous Derangements, with Illustrative Cases. By Ambrose L. Ranney, A.M., M.D. Reprint, 1892.

Trephining for the Cure of Epilepsy. By Middleton Michel, M.D., of Charleston, S. C. Montgomery, Ala.: Brown Printing Company, 1892.

Theoretical Chemistry, with Special Reference to the Constitution of Chemical Compounds. By Ira Remsen. Philadelphia: Lea Bros. & Co., 1892.

Obstetrics. By Charles W. Hayt, M.D. "The Students' Quiz Series." Philadelphia: Lea Bros. & Co., 1892.

Annual Lectures, Delivered before the Alumni Association of the College of Physicians and Surgeons of Baltimore, April 11 and 12, 1892. By W. E. B. Davis, M.D.

Report of an Operation for Removal of the Gasserian Ganglion. By Emory Lanphear, M.D., Ph.D., of Kansas City, Mo., Reprint, 1892.

When Shall We Trephine in Fractures of the Skull? By Emory Lanphear, M.D., Ph.D., of Kansas City, Mo. Reprint, 1892.

Clinical Report of Cystectomy for Polycystic Ovarian Tumor. By Prof. Howard A. Kelly. Baltimore, 1892.

Gynecological Technique. By Howard A. Kelly, M.D. Reprint. New York: M. J. Rooney, 1892.

A Review of Ideality of Medical Science. By Maurice J. Burstein, A.M., M.D. Reprint, 1892.

Habitual Abortion. By E. S. McKee, M.D., of Cincinnati, O. Reprint, 1892.

Twenty-third Annual Report of the Trustees of the Willard State Hospital for the Year 1891. Albany: James B. Lyons, 1892.

A Maid of Wolpai. By R. W. Shufeldt, M.D. Reprint. Washington, D. C.: Government Printing Office, 1892.

The Evolution of House-building among the Navajo Indians. By R. W. Shufeldt, M.D. Reprint. Washington, D. C.: Government Printing Office, 1892.